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CARDIOVASCULAR DISEASE

A man's heart and a wife's education: A 12-year coronary heart disease mortality follow-up in Norwegian men

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Background Low socioeconomic status is an established risk factor for coronary heart disease. Yet relatively few studies have examined whether wives' socioeconomic status may influence men's coronary heart disease (CHD) risk factors and mortality. We examined whether wives' education was associated with men's risk of CHD after taking into account the men's own educational level.

Methods Married men were identified in a population-based cohort recruited for a cardiovascular disease screening conducted 1977–1983 in three Norwegian counties. Differences in baseline risk factors and subsequent CHD mortality by men's and their wives' education were examined. The cohort was followed through 1992.

Results Wives' education was inversely related to the prevalence of men's sedentary behaviour, being overweight, having a high diastolic blood pressure, blood pressure treatment, and high total cholesterol and smoking in logistic regression analyses adjusting for men's age and education. For smoking and obesity, we observed a significant men's by wives' education interaction, with stronger inverse trends observed by wives' education among the higher-educated men. In prospective analyses, men's age-adjusted CHD mortality rates decreased with increasing level of wives' education within each stratum of men's education, with the exception of men in the lowest (7 years) education category where no trend by wives' education was observed. In additional multivariate analyses, adjusting for numerous baseline risk factors, the inverse trend in men's CHD mortality by wives' educational level remained significant only among men in the highest education category (⩾11 years of education).

Conclusions The data suggest that a partner's educational level could add valuable information to studies designed to characterize and measure the influence of socioeconomic status. Also, our data do not support other studies reporting that educated wives are hazardous for men's hearts.

Keywords Education, coronary heart disease

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Low socioeconomic status (SES) is an established risk factor for coronary heart disease (CHD) mortality,[1–4] and the socioeconomic gradient in risk provides valuable information on the extent to which this disease could be prevented in populations. Socioeconomic status is usually quantified by at least one of three direct indicators: income, education, or occupation. Numerous factors are indirectly related to SES and these in turn also are important health determinants. Indirect indicators include characteristics such as health-related behaviours, psychosocial support, stress, availability and use of health care services, and household and community resources. There have been numerous reports attempting to characterize the association of SES with heart disease and the mechanisms by which it may influence risk, of which we cite only a few papers.[1–9] Substantially fewer reports have explored whether the educational level of

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wives may be related to men's CHD.[10–18] Wives' educational level may help quantify aspects of the SES of a household and a husband's risk for CHD. Women, for example, may play a central role in shaping the lifestyle, health behaviours, and social life of the family, and educated women may improve the economic standing of a household. Thus, wives' education may have a protective association with men's CHD risk. Paradoxically, however, many studies examining the influence of wives' education have found an increased risk of CHD among men married to women with a high compared to a low level of education or among men married to women with a higher level of education than they attained.[10–14] Social status incongruity, defined as possessing markings of different social classes, was hypothesized to generate tensions and conflicts and increase men's risk of CHD.[19] Not all studies, however, have shown that having an educated wife was deleterious to men's cardiovascular health.[15–18]

Thus, we examined whether the educational level of wives of a cohort of over 20 000 Norwegian men predicted men's smoking behaviour and other cardiovascular disease risk factors at a baseline cardiovascular screening and men's subsequent risk for CHD mortality.

Materials and Methods

Study population

Married men were identified in a population-based cohort recruited for the Second Cardiovascular Disease and Risk Factor Screening Survey conducted by the National Health Screening Service of Norway between 1977 and 1983 in three Norwegian counties: Finnmark, Sogn and Fjordane, and Oppland. Study participants were born between 1925 and 1942, and were aged 35–56 years at the time of entry into the study. Of 29 350 eligible men; 26 366 (90%) participated in the survey, of whom 82% were married. The screening procedures have been described elsewhere.[20] Men were grouped by their own and their wives' education using information from a 1980 census of Norwegian residents.[21] Information on men's and wives' education was available for 92.7% (n = 20 038) of the married men (n = 21 620).

Baseline cardiovascular screening and assessment of mortality

The characteristics examined at the baseline screening included men's resting (second) diastolic and systolic blood pressure (measured using a mercury sphygmomanometer), total serum cholesterol, body mass index (BMI: weight in kg/height m^2), current smoking (yes versus no), and sedentary behaviour during leisure time. Also, information was collected on whether they received blood pressure medication (yes versus no), or had a health history of myocardial infarction or angina pectoris.[22,23] Total serum cholesterol levels were measured in non-fasting blood samples using a non-enzymatic method during the first year of the study and an enzymatic method thereafter: a correction factor was used to ensure comparability.[23] Mortality rates were based upon person-years from the screening date until death or censoring on 31 December 1992. Coronary heart disease deaths were determined by the International Classification of Diseases and Causes of Death (ICD) Eighth Revision for deaths through 1985 (410–411, 412.0–412.3, 413), and Ninth Revision (410–413, 414.0–414.1, 414.3, 414.9) for deaths 1986–1992.[24,25] The eighth and ninth revisions of the ICD differed in that a small number of deaths that would have been coded as 410–414 in the eighth revision would have been coded as 429.2 in the ninth revision.[26] However, in our data no ICD-9 429.2 deaths were registered, ensuring comparability in our data over time.

Statistical analyses

We examined men's characteristics at baseline by their wives' educational level, using analysis of variance for differences in age, and χ^2-trend for differences in men's education. Differences in all other baseline characteristics by wives' educational level were examined using logistic regression analyses adjusting for men's age and educational level and testing for the presence of a significant men's by wives' education interaction. When a significant interaction term was identified for a baseline characteristic, we stratified analyses by both men's and wives' educational level. For presentation of the stratified results, we calculated age-adjusted proportions of the baseline characteristic, using the direct method with the distribution of men aged 35–44, 45–50, and 51–56 as the standard population. We also tested significance in trends by wives' education within each stratum of men's education using logistic regression analyses adjusting for men's age (in years).

We examined the CHD mortality experience of the cohort by Cox proportional hazards analyses. We examined the effect of men's and wives' educational level (7, 8–9, 10, ⩾11 years) separately in age-adjusted analyses, and then in additional models including age, partner's education, and smoking. Men's by wives' education interaction terms were examined and, if significant, separate Cox proportional hazards analyses were conducted for each category of men's education. For presentation of the data, age-adjusted mortality rates were calculated using the direct method with the distribution of person-years in the three age groups (35–44, 45–50, 51–56) as the standard population. Men's age-adjusted CHD mortality rates (per 10 000 person-years of follow-up) were stratified by men's and their wives' educational level. In multivariate modelling we examined important risk factors for CHD measured at baseline: a history of myocardial infarction or angina pectoris, systolic blood pressure, total serum cholesterol, age, smoking, obesity, physical activity, and treatment for blood pressure.

As social status incongruity has been a focus of other papers, we also examined wives' education as lower, same, or higher than her husband's level in multivariate Cox proportional hazards analyses conducted separately for three strata of men's education (7 years and wife's level as same or higher, 8–10 years and wife's level as lower, same or higher, and ⩾11 years and wife's level as lower or same).

All statistical analyses used SPSS, and an EXCEL spreadsheet assisted in the calculation of age-adjusted rates and prevalence.

Results

Men's age at baseline varied significantly by their wives' educational level (ANOVA, d.f. = 3, $P < 0.001$) (Table 1). Men whose wives had 7 years of education were significantly older than men whose wives had ⩾8 years of education. Men's age, however, did not vary significantly by wives' education when analyses were limited to men whose wives had ⩾8 years of education

Table 1 Married men's baseline characteristics by their wives' educational level: Three Counties: Norway, 1977–1983

	Wives' education			
Men's baseline characteristics[#]	7 years (n = 6100)	8–9 years (n = 8870)	10 years (n = 3008)	⩾11 years (n = 2060)
Mean age (years)[a]	48	46	46	46*
⩾10 years education %[b]	19	31	53	79*
Sedentary %[c]	17	15	14	12*
Overweight % (kg/m^2 ⩾30)[c]	9	8	6	5#
High diastolic blood pressure %[c] (⩾100 mmHg)	15	12	12	10*
High systolic blood pressure %[c] (⩾170 mmHg)	5	4	3	3
High total cholesterol %[c] (⩾8 mmol/l)	10	7	6	5*
Smoking %[c]	54	46	40	29[#]
History of myocardial infarct or[c] angina pectoris %	5	3	2	2*
Blood pressure medication %	8	5	5	5*

[a] ANOVA, 3 d.f.

[b] χ^2 trend.

[c] Logistic regression analyses of men's characteristics by wives' educational level (entered as a continuous variable), adjusting for men's age (years) and education (as a categorical variable).

* *P*-value ⩽ 0.05.

[#] *P*-value ⩽ 0.05 for a men's by wives' education interaction term.

(ANOVA, d.f. = 2, $P = 0.4$). Wives' education was positively related to men's education, and inversely related to the prevalence of men's sedentary behaviour, being overweight (⩾30 kg/m^2), having a high diastolic (⩾100 mmHg) and systolic (⩾170 mmHg) blood pressure, a high total cholesterol (⩾8 mmol/l), smoking, treatment for blood pressure, and having a history of myocardial infarction or angina pectoris (Table 1). All trends by wives' educational level were significant ($P \leqslant 0.05$), with the exception of systolic blood pressure ($P \leqslant 0.10$), in logistic regression analyses adjusting for men's age and educational level (entered as a categorical variable).

For smoking and obesity, we observed significant men's by wives' education interaction terms. The age-adjusted prevalence of men's smoking at baseline decreased with increasing level of wives' education within each category of men's education (Figure 1). In age-adjusted logistic regression analyses conducted separately for each category of men's education, we found a weaker inverse smoking trend by wives' education among men with 7 years of education compared to men in the higher education categories (Figure 1). Similarly, the age-adjusted prevalence of obesity among men decreased significantly with increasing level of wives' education for men in the two highest categories of education, but not for less educated men (Figure 2).

By December 1992, 556 CHD deaths had been observed among the 20 038 men (Table 2). In Cox proportional hazards analyses, wives' education showed a stronger inverse trend with men's CHD mortality than did men's own educational level in age-adjusted analyses (Table 3). Similar results were obtained in analyses adjusting for age, partner's education, and smoking. In further analyses, we observed a significant men's by wives' education interaction term in the prediction of men's CHD mortality ($P \leqslant 0.05$). In stratified analyses, the unadjusted and age-adjusted CHD mortality rates (per 10 000 person-years of follow-up) decreased with increasing level of wives' education within each stratum of men's educational level, with the exception of men in the lowest education category (Table 2, Figure 3). In subsequent analyses, conducted separately for each category of men's education, the inverse CHD mortality trend by wives' educational level was strongest for men with ⩾11 years of education (*P*-value for trend < 0. 001), compared with the trends observed for men with 8–9 years of education (*P*-value for trend = 0.10), and 10 years of education (*P*-value for trend = 0.14). No trend was observed by wives' education among men with 7 years of education.

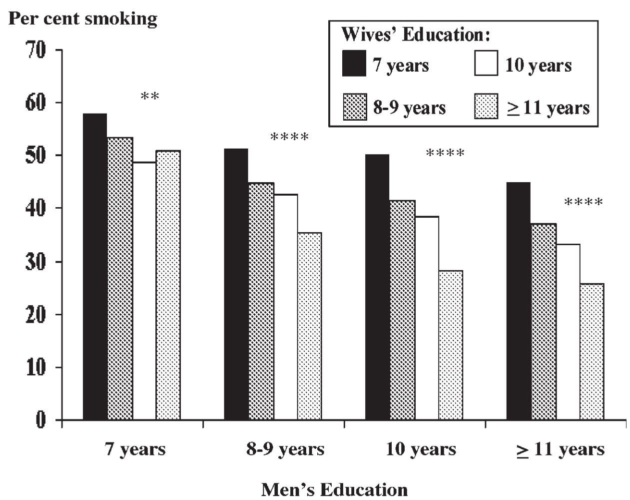

Figure 1 Men's age-adjusted prevalence of smoking by men's and their wives' educational level: Three Counties, Norway, 1977–1983

Tests for trend by wives' educational level in logistic regression analysis conducted separately for each category of men's education.

Probabilities for observed trends. *P*-value: * ⩽ 0.10, ** ⩽ 0.05, *** ⩽ 0.01, **** ⩽ 0.001.

In additional multivariate analyses, the men's by wives' education interaction term (education entered as two continuous variables) remained significant after adjusting for the effects of age, smoking, history of myocardial infarction or angina pectoris,

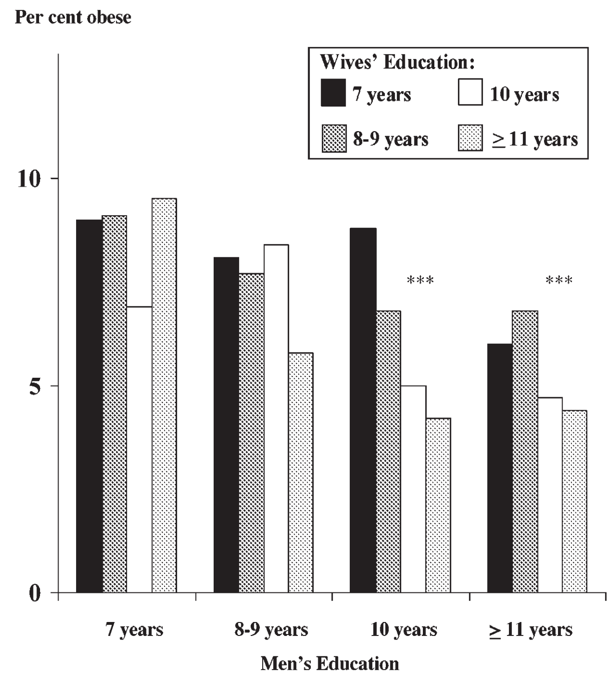

Figure 2 Men's age-adjusted prevalence of obesity by men's and their wives' educational level: Three Counties, Norway, 1977–1983

Tests for trend by wives' educational level, in logistic regression analyses. Analyses conducted separately for each category of men's education.

Probabilities for observed trends. *P*-value: * ⩽ 0.10, ** ⩽ 0.05, *** ⩽ 0.01, **** ⩽ 0.001.

systolic blood pressure, and total serum cholesterol (Table 4). The interaction term remained significant in additional modelling adjusting for obesity, physical activity and treatment for high blood pressure at baseline. In analyses where men's education was entered as a categorical variable and wives' education was entered as a continuous variable, we examined differences in slopes of the hazard beta coefficients associated with wives' education within each category of men's education (i.e. the slope of wives' education for men in the 7 years of education category serving as the reference category). Only men with ⩾11 years of education showed a significant decreasing trend in men's CHD mortality by increasing wives' educational level after adjusting for the multiple baseline risk factors (hazard beta coefficient = –0.35, SE = 0.14, *P*-value = 0.02). Similar results were obtained when we separately conducted the multivariate analyses for each stratum of men's education.

A total of 6221 wives had an educational level that was lower than that of her husband, 8795 wives had an educational level that was the same, and 5022 wives had an educational level that was higher than her husband's (Table 2). In age- and smoking-adjusted analyses, men with 7 years of education married to a woman with a greater level of education showed no reduction in CHD mortality compared to men married to a woman with the same level of education (hazard ratio [HR] = 1.1; 95% CI: 0.8–1.3). In contrast, men with ⩾11 years education married to a woman with ⩾11 years education had a 50% reduction in age-adjusted CHD mortality compared to equally educated men married to a woman with a lower level of education (HR = 0.5, 95% CI: 0.2–0.9). For men with 8–10 years of education, those married to a woman with a higher level of education had a non-significant 40% reduction in CHD mortality (HR = 0.6; 95% CI: 0.4–1.0) compared to men with a wife with lower education. Those married to a woman with the same years of education had a non-significant 10% reduction in CHD mortality (HR = 0.9; 95% CI: 0.7–1.2).

Discussion

Wives' education was inversely correlated to men's risk factors at the baseline cardiovascular screening and to men's subsequent risk of CHD mortality. Overall, the results suggest that wives' education was health promoting for their husbands. However, for men in the lowest education category, we observed no beneficial effect of wives' education on age-adjusted CHD mortality despite an ample sample size of men married to women with a higher level of education in this group. Also, for men with 8–10 years of education, we observed a weaker inverse association of wives' education with men's age-adjusted CHD mortality than we observed among men with ⩾11 years of education. We can only speculate the possible reasons for the differential effects of wives' education by level of men's education. Strong selection factors may be operating when men and women choose their spouse and these selection factors may have contributed to the associations observed. Also, we have no information regarding changes in marital status over time which may vary by men's baseline educational level. The extent of occupational and other

Table 2 Person-years of follow-up and coronary heart disease (CHD) mortality by educational level of men and their wives: Three Counties, Norway, 1977–1983

	Wives' education[a]											
	7 years			8–9 years			10 years			⩾11 years		
Men's education	No.	Person-years	CHD deaths	No.	Person-years	CHD deaths	No.	Person-years	CHD deaths	No.	Person-years	CHD deaths
7 years	3544	43 450	150	2819	33 850	86	596	7228	18	150	1828	7
8–9 years	1406	17 168	39	3302	38 990	78	819	9755	11	274	3272	3
10 years	644	7952	24	1424	17 118	38	677	8071	12	364	4277	8
⩾11 years	506	6114	19	1325	15 966	35	916	11 013	17	1272	15 171	11

[a] The diagonal represents men whose wives had the same level of education as they attained. The area above and to the right of the diagonal represents men whose wives had a higher level of education, and the area below and to the left of the diagonal represents men whose wives had a lower level of education than they attained.

Table 3 Men's coronary heart disease (CHD) mortality rates and relative risks (RR)[a] by men's and their wives' educational level. Married men, Three Counties, Norway

	Age-adjusted CHD mortality rate	Age-adjusted CHD mortality RR (95% CI)	Age and partner's education adjusted CHD mortality RR (95% CI)	Age, smoking, and partner's education adjusted CHD mortality RR (95% CI)
Men's education (years)				
7	27.3	1.0	1.0	1.0
8–9	19.9	0.8 (0.6–0.9)	0.8 (0.7–1.0)	0.8 (0.7–1.1)
10	21.3	0.8 (0.6–1.0)	0.9 (0.7–1.2)	1.0 (0.8–1.3)
⩾11	18.4	0.7 (0.5–0.9)	0.8 (0.7–1.1)	1.0 (0.7–1.3)
Wives' education (years)				
7	30.0	1.0	1.0	1.0
8–9	23.9	0.8 (0.7–1.0)	0.9 (0.8–1.1)	1.0 (0.8–1.2)
10	16.2	0.6 (0.4–0.8)	0.7 (0.5–0.9)	0.7 (0.5–1.0)
⩾11	13.3	0.5 (0.3–0.7)	0.6 (0.4–0.9)	0.6 (0.4–0.9)

[a] Based upon Cox proportional hazards analyses.

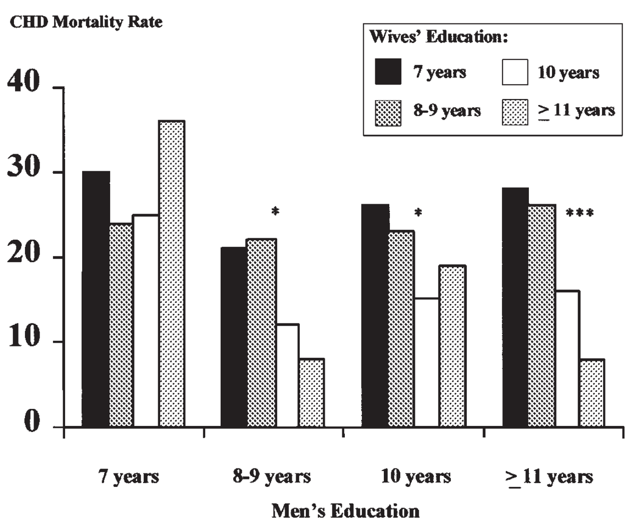

Figure 3 Men's age-adjusted coronary heart disease mortality (per 10 000 person-years) by men's and their wives' educational level: Three Counties, Norway, 1977–1983

Tests for trend by wives' educational level, in Cox proportional hazards analysis conducted separately for each category of men's education.

Probabilities for observed trends. *P*-value: * ⩽ 0.10, ** ⩽ 0.05, *** ⩽ 0.01, **** ⩽ 0.001.

stressors promoting CHD may also vary by men's educational level and may outweigh any potential benefit of having a better educated wife for men in the lowest education category.

Regardless of the possible explanations, our findings are in contrast to several studies that found an educated wife was hazardous to her husband's cardiovascular health.[10–14,27] An increase in ischaemic heart disease death, for example, was observed for men whose wives had attained a higher level of education compared to men whose wives had attained a lower level of education than they had attained in an upper-middle-class Caucasian population in California, US.[10] In an alternative analysis of those data, however, men whose wives had attained a higher level of education showed no difference in ischaemic heart disease mortality compared to men whose wives had the same level of education.[28]

In the Framingham Heart Study, after 10 years of follow-up of 269 spouse pairs, men married to women with ⩾13 years of education were 2.6 times more likely to develop CHD (the majority of which was angina pectoris) than men married to women with a grammar school education (95% CI: 1.0–6.9).[11] In analyses of the same cohort, the CHD risk of men varied by their Type A and Type B status and by the educational and social status of their wives.[27] Compared to Type B men, Type A men were 2.5 times ($P = 0.07$) as likely to develop CHD if married to a woman with ⩾13 years of education, and 3.5 times ($P = 0.01$) more likely to develop CHD if married to a woman employed outside the home. It is unclear, however, how the sample of Framingham men was selected for participation in the sub-study.

In the Western Collaborative Group Study, 130 CHD cases and control families were recruited at the end of the 8.5-year follow-up to investigate familial behaviour and psychosocial aspects of participants.[14] Similar to the Framingham results, Type A men married to women with ⩾13 years of schooling had an odds ratio of 3.6 (95% CI: 1.3–10.1) for CHD, whereas for Type B men having an educated wife was protective (OR = 0.4, 95% CI: 0.1–1.1). Wives' employment outside the home was not significantly related to husband's risk of CHD. Because Type A men were half as likely to participate in the family sub-study as Type B men, the findings are questionable.

Not all studies have shown adverse effects of wives' education on men's heart disease risk.[15–18] In an Israeli cohort, symptoms of angina pectoris or risk of myocardial infarction was not associated with wives' educational level.[15,16] In a study examining 133 male primary cardiac arrest cases and their controls, men whose wives had >12 years of education had an OR of 0.8 (95% CI: 0.5–1.3) compared to men with less educated wives.[17] Also, an educated wife protected husbands against CHD mortality in a cohort of 2452 Lithuanian and 3365 Dutch men.[18] The protective influence of wives' education remained apparent after controlling for men's educational level and numerous CHD risk factors.

A caveat of our study is that we have no information regarding changes in marital status or of changes in smoking or other risk factors over time. Our prospective results, however, are

Table 4 Men's coronary heart disease mortality hazard beta coefficients, standard error (SE) and *P*-values obtained from multivariate Cox proportional hazards analysis. Three Counties, Norway

	Beta coefficient	(SE)	*P*-value
Age (years)	0.07	0.01	0.000
Smoking (yes versus no)	0.94	0.09	0.000
History of myocardial infarction/angina (yes versus no)	1.99	0.11	0.000
Total serum cholesterol (mmol/l)	0.31	0.03	0.000
Systolic blood pressure (mmHg)	0.02	0.002	0.000
Wives' education within stratum of men's education[a]			
Men's level			
7 years	Referent		
8–9 years	–0.11	0.15	0.45
10 years	–0.08	0.15	0.59
⩾11 years	–0.35	0.14	0.02

[a] Men's education entered as four categories and wives' education entered as a continuous variable of four levels, coefficients adjusted for all other parameters displayed.

compatible with those of the baseline screening. Norway has an equitable health care delivery system and, at least in this cohort, minimal disparities in income. Given that the population represents a homogeneous group of men, the associations observed are striking. Nordic countries are considered to be more egalitarian than many other countries, and perceptions regarding women and education may be considerably different from that of other cultures. Cultural differences between countries may also exist in the selection factors that operate when individuals choose their spouse and these differences may contribute to the discrepancies observed in the literature.

As the socioeconomic gradient in CHD risk was established at the time of the baseline screening, it is not surprising that the protective association of wives' education with men's CHD mortality was no longer apparent for men with 8–10 years of education after adjusting for multiple baseline risk factors. The fact that wives' education remained significant in the multivariate analyses for men with ⩾11 years education was surprising, however.

Educated women have opportunities to improve the economic status of a household, which in turn may minimize economic stressors for her husband. Also, higher levels of education in women have been associated with more favourable health and dietary behaviours and reduced CHD risk factors and mortality among women.[29–31] Wives' educational level, in addition to that of her husband's, may influence men's dietary habits, health-care seeking behaviours, compliance with medical advice, smoking, smoking cessation, and other health-related behaviours. Even in countries with universal health care coverage, such as Norway, education may influence health-care seeking behaviour or likelihood of specialty referrals. In Canada, which also has universal health care coverage, low income and low educated patients had a greater use of primary care, but a lower rate of referral to physician specialists than Canadians with a moderate or high income and educational level.[32] Despite the possibility that wives' educational level may influence husband's health-related behaviours, we are unaware of published studies examining the association of wives' educational level with husbands' health-seeking or other health-related behaviours. While it was beyond the scope of our paper to address the myriad of factors that may define socioeconomic status, our data suggest the importance of considering a partner's educational level in studies designed to characterize and measure the influence of socioeconomic status. Our data also suggest that the magnitude of the beneficial effect of wives' education may vary by men's level of education. Also, our data do not support other studies reporting that educated wives are hazardous for men's hearts.

KEY MESSAGES

- Wives' education was inversely related to men's baseline coronary heart disease (CHD) risk factors and subsequent risk for CHD mortality.
- The magnitude of the beneficial effect of wives' education increased with increasing level of men's education.
- Our data do not support other studies reporting that educated wives are hazardous for men's hearts.

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Commentary: Is an educated wife hazardous to her husband's heart?: Never, always, or sometimes?

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Contemporary women constitute the majority of college undergraduates and are achieving a higher level of educational attainment than any other previous generation in the US.[1] A similar experience is observed in other developed countries.[2] Thus, a natural experiment of enormous proportions is occurring, and it is important to ask what is the public health impact of women's increasing educational attainment.

In the present issue, Egeland and colleagues[3] take a fresh look at the public health impact of women's education on their husbands. In a cohort of over 20 000 married Norwegian men followed for 12 years, those married to educated women (defined as ⩾11 years) experienced lower risk for coronary heart disease (CHD) mortality than did men married to less educated women. The benefit of wife's education remained apparent after statistical adjustments for men's own educational attainment and was strongest among the most educated men (also defined as ⩾11 years).

Are we to conclude then that an educated wife is *never* hazardous to her husband's health and perhaps even beneficial? No, we cannot. As the authors note (see ref. 3), major epidemiological studies conducted in the US, including the Framingham Heart Disease Study, Rancho Bernardo Study, Western Electric Study, and Western Collaborative Group Study, report an adverse effect on men's CHD rates of marriage to well educated women.

Shall we conclude that with the exception of the quite fortunate Norwegian men, educated women *always* have a damaging effect on their partner's health? After all, a reasonable explanation has been offered: the greater education of wives relative to their husbands could have induced stress and marital discord, which, in turn, increased men's risk for CHD mortality. However, the data on marriage and health do not yield a simple picture: Being married is indeed beneficial to men, but marital discord has a weaker effect on men than on their wives.[4] Furthermore, several excellent studies show that the husbands of less educated women are at elevated risk for CHD mortality.[3]

At present then it is most reasonable to conclude that *sometimes* better educated women confer a disadvantage and *sometimes* they confer an advantage. Such may be an accurate summary of the literature, but it is also unsatisfactory and unsatisfying. The challenge of social epidemiology is to identify *a priori* the psychobiological processes underlying social constructs and include measures of proposed psychosocial and biological mediators in the study protocol. In this way, well articulated hypotheses and models can be *confirmed or disconfirmed*.

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Taking advantage of existing 1980 census data and a risk factor survey conducted between 1977 and 1983, Egeland *et al.* did not have the luxury of comprehensive testing of psychosocial and biological processes. In that circumstance a natural response to inconsistent findings is to search for critical differences in study design, health outcomes, statistical power, and sample characteristics and Egeland *et al.* provide an insightful discussion of such differences. It is also worthwhile speculating what the meaning of being married to educated women may have been in Norway and the US at the time the studies were conducted. Norway is widely considered to be an egalitarian culture. Norwegian women were given the right to vote in 1913. Men born in the cohort studied by Egeland *et al.* lived through World War II, when their country was occupied by Nazi Germany. Men born at a similar time in the US returned after World War II service to the benefits of higher education through the GI bill. From 1940 through 1970, the rates of men's attending and graduating from college increased dramatically, while the proportion of women attending college declined.[1] American men married to educated women were atypical, and perhaps experienced more role conflicts than did their Norwegian counterparts. One might anticipate that as it becomes normative for men to be married to educated women in the US the associated stigma and role conflict may lessen.

Another way to frame the question of the public health consequences of women's increasing educational attainment is to consider whether it leads to families experiencing greater or lesser prestige in society and greater or lesser access to resources. High prestige and good access to resources are the key elements of high socioeconomic status (SES) and high SES is a well-established predictor of longevity and low rates of CHD morbidity.[5] In most circumstances, educated wives should contribute to families having greater resources and prestige, especially as better educated women have better health themselves.[6] Husbands with less education than their wives may experience an offsetting loss of prestige but this effect is probably highly dependent on the cohort and times. Future studies should consider the framework of SES and the associated psychobiological processes in understanding the health impact of women's education.

In sum, Egeland and her colleagues are to be congratulated for their meaningful contribution to addressing an important public health question: Is an educated wife hazardous to her husband's heart? At present, the answer is *sometimes an educated wife is health damaging and sometimes she is health promoting.* I suspect that in contemporary cohorts, increasing education of women will lead to their families having greater access to resources and higher prestige, and to better health in both husbands and wives. Time will tell.

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