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Gender Differences in Coronary Heart Disease and Health-Related Quality of Life: Findings from 10 States from the 2004 Behavioral Risk Factor Surveillance System

EARL S. FORD, M.D., M.P.H., ALI H. MOKDAD, Ph.D., CHAOYANG LI, M.D., Ph.D., LISA C. McGUIRE, Ph.D., TARA W. STRINE, M.P.H., CATHERINE A. OKORO, M.S., DAVID W. BROWN, M.S.P.H., M.Sc., and MATTHEW M. ZACK, M.D.

ABSTRACT

Background: **Our objective was to examine differences in health-related quality of life (HRQOL) between people with coronary heart disease (CHD) and those without this condition in a population-based sample of U.S. adults and to examine the interaction between CHD and diabetes on HRQOL.**

Methods and Results: **We performed a cross-sectional analysis of data from 50,573 participants aged ≥18 years from 10 states of the 2004 Behavioral Risk Factor Surveillance System (BRFSS). Data were self-reported. HRQOL was assessed with the Centers for Disease Control and Prevention (CDC) HRQOL-4 measures. After adjusting for age, gender, race or ethnicity, educational status, marital status, employment status, smoking status, body mass index (BMI), and alcohol use, the percentages of women without CHD who, during the previous 30 days, reported experiencing ≥14 physically unhealthy days, ≥14 mentally unhealthy days, and ≥14 activity-limitation days were 7.5%, 10.4%, and 3.6%, respectively, compared with 16.5% (odds ratio [OR] = 2.49, 95% confidence interval [CI] 2.02, 3.07), 14.5% (OR = 1.58, 95%, CI 1.22, 2.04), and 8.4% (OR = 2.56, 95% CI 1.98, 3.30) for women with CHD. The adjusted percentages of men without CHD who reported experiencing ≥14 physically unhealthy days, ≥14 mentally unhealthy days, and ≥14 activity-limitation days were 5.6%, 6.0%, and 3.0%, respectively, compared with 10.1% (OR = 1.85, 95% CI 1.47, 2.32), 8.7% (OR = 1.32, 95% CI 1.00, 1.74), and 6.4% (OR = 1.99, 95% CI 1.49, 2.66) for men with CHD. A higher adjusted percentage of women with CHD reported experiencing ≥14 physically unhealthy days ($p < 0.001$) and ≥14 mentally unhealthy days ($p = 0.002$) but not ≥14 activity-limitation days ($p = 0.090$) than men with CHD.**

Conclusions: **People with CHD have significantly impaired HRQOL compared with those without CHD. HRQOL among women with CHD is worse than that among men with CHD.**

Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia.

The findings and conclusions in this paper are those of the authors and do not represent the views of the Centers for Disease Control and Prevention.

INTRODUCTION

Coronary heart disease (CHD) continues to be the leading cause of mortality in the United States.[1] An estimated 13 million adults in the United States were thought to have this condition in 2002.[1] For 2005, the economic costs associated with this condition were estimated to exceed $140 billion.[1]

The prevalence, incidence, and costs of a disease provide critical insights about its public health burden. Measures of health-related quality of life (HRQOL) complement other parameters in offering a richer understanding of the impact of various conditions on the health of populations. HRQOL typically assesses people's physical, psychological, and emotional functioning as well as their social well-being. Measures of HRQOL are routinely used in clinical trials to help gauge the success of new treatments. In clinical practice, measuring HRQOL can be useful in monitoring the success of managing patients. At the population level, proposed uses of HRQOL data include assessment of the well-being of a population, interpopulation comparisons, general population monitoring, input for health policy development and resource allocation, establishment of national health objectives and measuring progress toward such goals, evaluation of population-based interventions, and identifying and measuring progress toward eliminating health disparities.[2,3]

Although mostly clinical studies have shown that HRQOL among survivors with CHD in the U.S. population is lower than among people without CHD, little is known about differences in HRQOL at the population level. Yet an understanding of HRQOL among people with CHD at the population level is valuable for several reasons. Measuring HRQOL among people with CHD provides information about the societal burden of this condition. By incorporating HRQOL into surveillance systems for CHD, trends in HRQOL among patients with CHD, possible geographic and sociodemographic disparities in HRQOL in the population, and progress in meeting national health objectives can be ascertained. In addition, international comparisons of HRQOL among people with CHD can highlight possible differences in the burden of this disease across populations and provide insights into the relationships between CHD and HRQOL.

Therefore, the purpose of our study was to compare HRQOL between people with CHD and people without this condition using a population-based sample. Furthermore, because of the close relationships between CHD and diabetes mellitus, a condition also associated with reduced HRQOL, a second purpose of our study was to examine whether the burden of HRQOL differed between people who had only diabetes, only CHD, or both diabetes and CHD. In addition, women with CHD may have lower HRQOL than men.[4–9] Thus, a third aim of our study was to examine how CHD and the combination of CHD and diabetes may affect differences in HRQOL between men and women.

MATERIALS AND METHODS

Data for this analysis are from the Behavioral Risk Factor Surveillance System (BRFSS) conducted in 2004.[10] The BRFSS is conducted in all 50 states and three territories. State health agencies selected for interview an independent probability sample from noninstitutionalized adults aged ≥18 years with telephones using a multistage sampling design. All states used an identical core questionnaire administered over the telephone by trained interviewers. The median response rate was 52.7%. The survey was reviewed by the Human Research Protection Office at the Centers for Disease Control and Prevention (CDC) and determined to be exempt from human subject guidelines.

In addition to a core set of questions that all participating states and territories use, optional modules covering a variety of topics were available for use. In 2004, 10 states administered the cardiovascular disease module: Delaware, Kansas, Louisiana, Ohio, Oklahoma, Pennsylvania, South Carolina, Virginia, Washington, and West Virginia. Therefore, the analyses are limited to data from those 10 states.

Respondents who answered "yes" to either of two questions: Has a doctor, nurse, or other health professional ever told you that you had any of the following: (1) a heart attack, also called a myocardial infarction, or (2) angina or CHD?" were considered to have CHD. Participants were considered to have diagnosed diabetes if they answered "yes" to the question: "Have you ever been told by a doctor that you had diabetes?" Responses included: (1) yes, (2) yes, but female told only during pregnancy, (3) no, (4) no, prediabetes

Table 1. Sociodemographic Characteristics by Coronary Heart Disease and Diabetes among 50,573 Participants Aged ≥18 Years, Behavioral Risk Factor Surveillance System, 2004[a]

	None (n = 43,298)	*Diabetes only (n = 3,498)*	*Coronary heart disease only (n = 2,729)*	*Coronary heart disease and diabetes (n = 1,048)*
Age, years	43.8 (0.1)	57.9 (0.5)	62.8 (0.5)	64.2 (0.5)
Women				
18–29 years	21.6 (0.5)	3.1 (0.5)	1.2 (0.3)	0.4[b]
30–39 years	19.0 (0.4)	7.9 (0.9)	5.4 (1.2)	0.8 (0.3)
40–49 years	21.6 (0.4)	16.8 (1.6)	12.3 (1.8)	9.6 (2.9)
50–59 years	16.5 (0.4)	21.6 (1.5)	18.1 (1.9)	19.0 (2.5)
60–69 years	9.8 (0.3)	25.3 (1.6)	21.6 (1.8)	36.6 (3.9)
70+ years	11.5 (0.3)	25.3 (1.7)	41.3 (2.2)	33.5 (3.3)
Men				
18–29 years	25.1 (0.7)	3.6[b]	2.2[b]	0.0
30–39 years	21.7 (0.5)	7.0 (1.0)	5.3 (1.6)	0.6[b]
40–49 years	22.6 (0.5)	20.4 (2.0)	11.3 (1.5)	7.6 (2.0)
50–59 years	15.6 (0.4)	24.5 (1.9)	20.5 (1.6)	23.7 (3.3)
60–69 years	8.3 (0.3)	22.3 (1.7)	28.2 (2.2)	35.6 (3.8)
70+ years	6.7 (0.3)	22.3 (1.8)	32.4 (1.9)	32.5 (3.4)
% Women	51.1 (0.4)	49.9 (1.5)	41.7 (1.6)	38.3 (2.6)
% White	80.7 (0.3)	76.9 (1.2)	85.1 (1.1)	82.0 (1.9)
% High school graduate	92.0 (0.2)	86.3 (1.1)	84.9 (1.1)	81.4 (2.0)

[a]Values represent mean or percentage and standard error.
[b]Relative standard error exceeds 30%. Estimates should be cautiously interpreted.

or borderline diabetes. Participants who provided one of the latter three answers were not considered to have diagnosed diabetes.

CDC developed a four-item set of HRQOL questions (CDC HRQOL-4) to meet the need for brief and valid measures to track physical and mental health trends and disparities in general populations.[11] The four HRQOL questions were: "Would you say that in general your health is excellent, very good, good, fair, or poor?" "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?" (physically unhealthy days). "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" (mentally unhealthy days). "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?" (activity-limitation days).

These four BRFSS questions—despite their brevity—have good construct validity[12–14] and reasonably good criterion validity with respect to the Medical Outcomes Study Short-Form 36 (SF-36) in both healthy and disabled populations.[15] The unhealthy days measures have been validated in several population studies[12,14,16] and have been found to predict mortality and use of health services among older adults.[17,18] Furthermore, the questions have been found to have moderate to excellent reliability.[19] The activity-limitation days question, rather than tracking perceived unhealthy days, uses a more severe health standard, that is, limitation of usual activity, and is a useful indicator of disability.[20–23]

Covariates in our analyses were age, gender, race or ethnicity, educational status, marital status, employment status, smoking status, participation in any physical activity or exercise during the past month, body mass index (BMI), and alcohol use. All these variables were based on self-reported data.

We used the statistical software SUDAAN to account for the complex sampling design of the survey.[24] Because of the skewed distributions of the HRQOL variables, we dichotomized all three measures into ≥14 days and <14 days. This cut-off point corresponds to approximately the 90th percentile for physically unhealthy days and mentally unhealthy days. We calculated percentages adjusted for age (continuous), gender, race or ethnicity (white, African American, Hispanic, other), educational status (never attended school

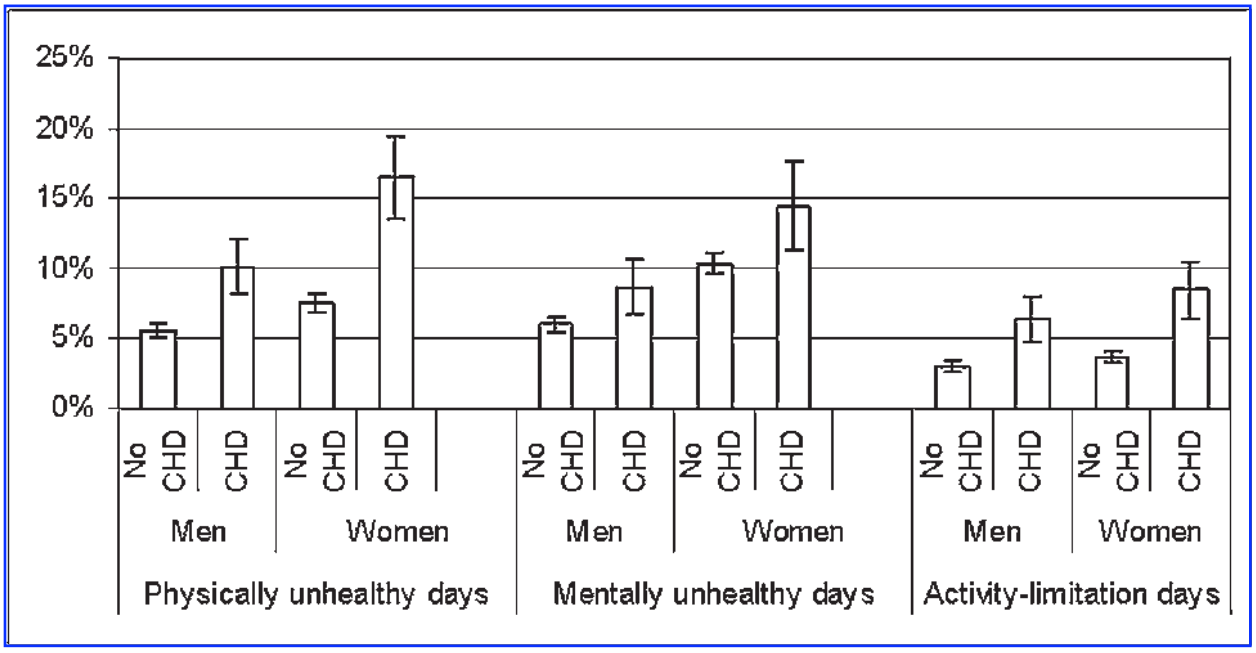

FIG. 1. Adjusted percentage (95% CI) of participants with ≥14 unhealthy HRQOL days among 54,669 participants aged ≥18 years, by sex and presence or absence of coronary heart disease (CHD), Behavioral Risk Factor Surveillance System, 2004. Percentages are adjusted for age, sex (except sex-specific models), race or ethnicity, education, marital status, employment status, smoking status, participation in any physical activity or exercise, BMI, and alcohol use.

or only attended kindergarten, grades 1–8, grades 9–11, grade 12 or GED, college 1–3 years, college ≥4 years), marital status (divorced, widowed, separated, never married, member of an unmarried couple), employment status (employed for wages, self-employed, out of work for >1 year, out of work for <1 year, homemaker, student, retired, unable to work), smoking status (never, former, current smoker), BMI (continuous), and alcohol use (drinks per day) using logistic regression analysis. To examine associations between CHD and HRQOL after adjusting for the aforementioned set of covariates, logistic regression analysis was performed.

RESULTS

In the 10 states that administered the cardiovascular disease module in 2004, there were 60,414 respondents. Responses to these questions were provided by 57,672 for myocardial infarction (MI), 57,463 for angina pectoris or CHD, and 60,307 for diabetes. A total of 55,060 people had complete data for CHD, diabetes, and HRQOL. After eliminating participants with missing data for one or more covariates, 50,573 were available for the analyses: 3,498 with only diabetes (weighted 5.7%), 2,729 with only CHD (weighted 4.3%), and 1,048 with both diabetes and CHD (weighted 1.7%).

After adjusting for age, the weighted prevalence of MI was 3.6%, the prevalence of angina pectoris or CHD was 4.2%, the prevalence of either form of CHD was 6.0%, and the prevalence of diabetes was 7.2%. Overall, the mean age was 45.8 years, 50.4% of participants were women, 80.7% were white, 10.2% were African American, 3.6% were Hispanic, 5.5% were of another ethnicity, and 91.2% were high school graduates. Information stratified by disease status is shown in Table 1. Among all participants, 65.4% reported having no physically unhealthy days, 65.7% had no mentally unhealthy days, and 79.9% had no activity-limitation days. Furthermore, 10.4% reported having ≥14 physically unhealthy days, 10.3% had ≥14 mentally unhealthy days, and 6.6% had ≥14 activity-limitation days.

Participants with CHD reported significantly increased physically unhealthy days, mentally unhealthy days, and activity-limitation days compared with participants who did not report having CHD (Fig. 1). Compared with women who did not report having CHD, higher adjusted percentages of women with CHD reported having ≥14 physically unhealthy days (absolute dif-

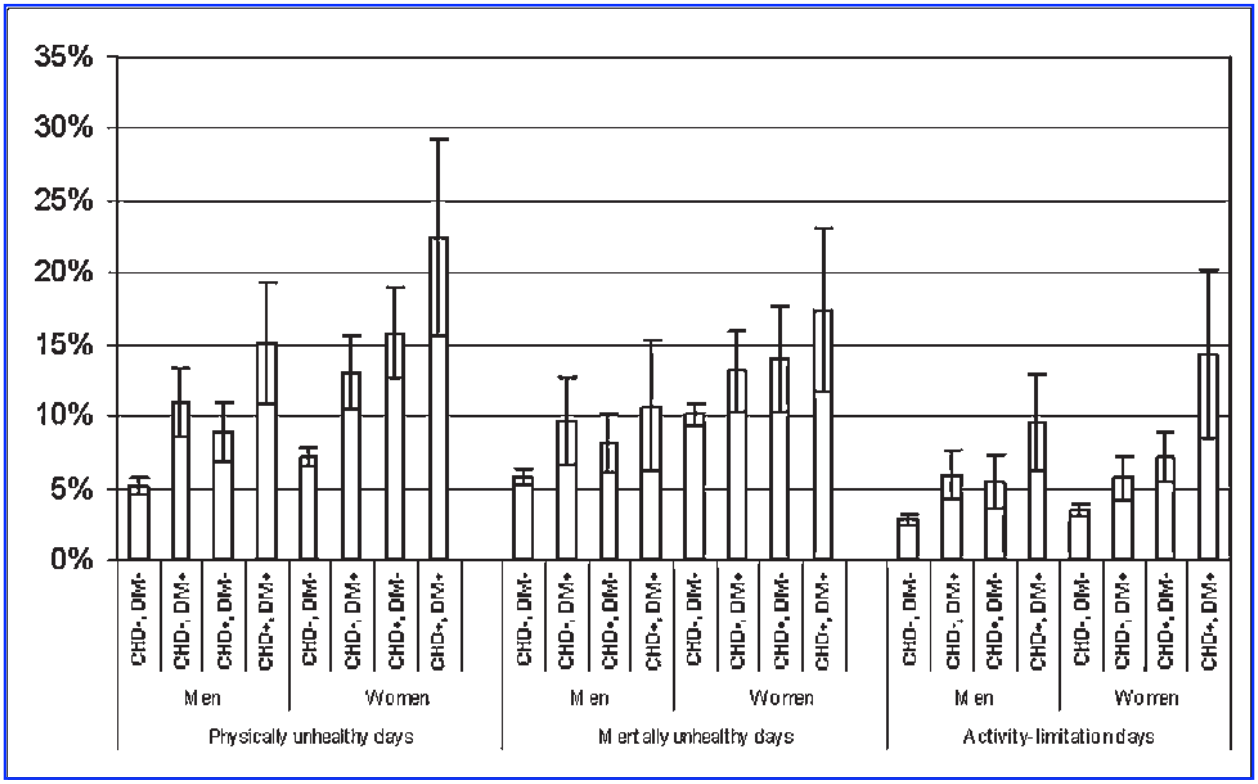

FIG. 2. Adjusted percentage (95% CI) of participants with ≥14 unhealthy HRQOL days among 54,669 participants aged ≥18 years, by sex and presence or absence of coronary heart disease (CHD) and diabetes (DM), Behavioral Risk Factor Surveillance System, 2004. Percentages are adjusted for age, sex (except sex-specific models), race or ethnicity, and education, marital status, employment status, smoking status, BMI, and alcohol use.

ference = 9.0%, $p < 0.001$), reported having ≥14 mentally unhealthy days (absolute difference = 4.1%, $p = 0.010$), and reported having ≥14 activity-limitation days (absolute difference = 4.8%, $p < 0.001$). Compared with men who did not report having CHD, higher adjusted percentages of men with CHD reported having ≥14 physically unhealthy days (absolute difference = 4.5%, $p < 0.001$), ≥14 mentally unhealthy days (absolute difference = 2.7%, $p = 0.011$), and ≥14 activity-limitation days (absolute difference = 3.4%, $p < 0.001$). A higher adjusted percentage of women with CHD than men with CHD reported experiencing ≥14 physically unhealthy days (absolute difference = 6.4%, $p < 0.001$) and ≥14 mentally unhealthy days (absolute difference = 5.8%, $p = 0.002$) but not ≥14 activity-limitation days (absolute difference = 2.0%, $p = 0.090$).

Impaired HRQOL was particularly evident among people who reported having both CHD and diabetes (Fig. 2). After adjustment for all the covariates, 18.4% of those participants reported experiencing ≥14 physically unhealthy days, 13.8% had ≥14.0 mentally unhealthy days, and 11.5% had ≥14 activity-limitation days. In contrast, similar percentages of people with either diabetes or CHD reported ≥14 physically unhealthy days (11.9% for diabetes, 11.9% for CHD), ≥14 mentally unhealthy days (11.1% for diabetes, 10.7% for CHD), and ≥14 activity-limitation days (5.8% for diabetes, 6.3% for CHD). In comparison, 6.1% participants without either condition reported ≥14 physically unhealthy days, 7.7% ≥14.0 mentally unhealthy days, and 3.1% ≥14 activity-limitation days.

Compared with women who had only CHD, smaller adjusted percentages of men who had only CHD reported having ≥14 physically unhealthy days (absolute difference = 6.9%, $p < 0.001$) and ≥14 mentally unhealthy days (absolute difference = 5.8%, $p = 0.006$) (Fig. 2). However, no significant gender difference in activity-limitation days was present (absolute difference = 1.7%, $p = 0.164$). Borderline significantly smaller percentages of men who had both diabetes and CHD reported having ≥14 physically unhealthy

Table 2. Odds Ratios[a] (95% CI) for Association between Impaired Health-Related Quality of Life and Presence of Coronary Heart Disease (CHD) or Diabetes Mellitus (DM) among Adults Aged ≥18 Years, Behavioral Risk Factor Surveillance System, 2004

	≥14 physically unhealthy days	*≥14 mentally unhealthy days*	*≥14 activity-limitation days*
Coronary heart disease			
Total (n = 50,573)	2.15 (1.84, 2.50)	1.47 (1.22, 1.78)	2.31 (1.91, 2.80)
Men (n = 19,852)	1.85 (1.47, 2.32)	1.32 (1.00, 1.74)	1.99 (1.49, 2.66)
Women (n = 30,721)	2.49 (2.02, 3.07)	1.58 (1.22, 2.04)	2.56 (1.98, 3.30)
p value for interaction between sex and CHD	0.104	0.923	0.591
Diabetes			
Total (n = 50,573)	2.14 (1.84, 2.50)	1.52 (1.26, 1.83)	2.09 (1.74, 2.52)
Men (n = 19,852)	2.41 (1.92, 3.02)	1.62 (1.18, 2.22)	2.20 (1.68, 2.88)
Women (n = 30,721)	1.95 (1.59, 2.39)	1.44 (1.16, 1.79)	1.96 (1.53, 2.52)
p value for interaction between sex and diabetes	0.343	0.210	0.263
DM or CHD or both			
Total (n = 50,573)			
No DM, no CHD	1.00	1.00	1.00
DM, no CHD	2.08 (1.74, 2.48)	1.49 (1.21, 1.85)	1.86 (1.51, 2.30)
No DM, CHD	2.08 (1.74, 2.49)	1.44 (1.15, 1.79)	2.06 (1.65, 2.58)
DM and CHD	3.45 (2.66, 4.47)	1.92 (1.39, 2.64)	4.01 (2.94, 5.47)
Men (n = 19,852)			
No DM, no CHD	1.00	1.00	1.00
DM, no CHD	2.39 (1.83, 3.13)	1.65 (1.14, 2.40)	2.13 (1.53, 2.95)
No DM, CHD	1.75 (1.31, 2.33)	1.30 (0.95, 1.76)	1.89 (1.30, 2.73)
DM and CHD	3.33 (2.35, 4.73)	1.75 (1.06, 2.90)	3.25 (2.14, 4.92)
Women (n = 30,721)			
No DM, no CHD	1.00	1.00	1.00
DM, no CHD	1.88 (1.49, 2.36)	1.40 (1.10, 1.79)	1.70 (1.30, 2.23)
No DM, CHD	2.46 (1.95, 3.11)	1.55 (1.14, 2.11)	2.23 (1.71, 2.90)
DM and CHD	3.68 (2.47, 5.47)	2.00 (1.34, 2.97)	4.72 (2.90, 7.67)
p value for interaction between sex and DM/CHD	0.208	0.675	0.390

[a]Adjusted for age, sex (except sex-specific models), race or ethnicity, education, marital status, employment status, smoking status, participation in any physical activity or exercise, BMI, and alcohol use.

days (absolute difference = 7.4%, $p = 0.066$) or ≥14 mentally unhealthy days (absolute difference = 6.7%, $p = 0.061$) than women with both diabetes and CHD. No significant gender difference was noted for having ≥14 activity-limitation days (absolute difference = 4.8%, $p = 0.145$).

Among both men and women, CHD and diabetes were each associated with higher odds for experiencing ≥14 physically unhealthy days, mentally unhealthy days, and impaired limitation days (Table 2). Furthermore, men and women who had both CHD and diabetes had the highest odds of having impaired HRQOL. We found no evidence that the odds ratios differed by sex.

DISCUSSION

In population-based samples of adults from 10 states in the United States, participants who had CHD were significantly more likely to report more physically unhealthy days and mentally unhealthy days during the 30 days prior to their interview than participants without CHD. Furthermore, women with CHD reported a higher number of physically unhealthy days and mentally unhealthy days than men with CHD. Our results illustrating that people with both diabetes and CHD have especially greatly diminished HRQOL are consistent with findings from previous studies of people with diabetes showing that

the presence of CHD or macrovascular complications is associated with reduced HRQOL.[25–31] Of note is that a very large percentage of women with both CHD and diabetes were likely to report experiencing ≥14 physically unhealthy days and ≥14 mentally unhealthy days in the previous 30 days.

HRQOL and CHD

Previous studies have shown that people with CHD experience impaired HRQOL.[32–35] In a Swedish study conducted from 1989 to 1991, 413 patients with an acute MI were compared with 88 population controls.[32] Patients with acute MI perceived their health status as worse 1 month and 1 year after their event. In a British study conducted in 1997, the Medical Outcomes Study SF-36 scores of 424 patients who had survived an MI were significantly lower on all domains of the SF-36 compared with normative data.[35] In a Spanish study that included 132 patients who had an acute episode of coronary disease, patients' scores were significantly lower for physical, emotional, and social functioning domains of the SF-36.[34] On the other hand, among 301 US women in the Estrogen Replacement and Atherosclerosis (ERA) trial, a previous MI did not significantly predict scores of either the Physical Component Summary or Mental Component Summary of the SF-36.[33]

Interaction between CHD and diabetes

The pattern between disease state and HRQOL that we observed shows interesting parallels to findings from other studies on the interplay between diabetes and CHD and mortality.[36–39] In those studies, participants with only diabetes or only CHD had approximately the same risk of dying from CHD as those who had neither of the two conditions. Patients with both conditions, however, had a strikingly higher risk of dying from CHD. Perhaps impaired HRQOL could serve as a useful prognostic indicator for mortality because HRQOL scores were shown to predict 180-day mortality after coronary artery bypass graft (CABG) surgery,[40] 8-month mortality and cardiovascular morbidity among patients with CHD or heart failure,[41] and 1-year mortality among patients with chronic coronary artery disease.[42] Thus, identifying patients with impaired HRQOL may allow healthcare providers to optimize care to these patients and, hopefully, lower their risk for future adverse events.

The database we used did not allow us to study the reasons for the large number of impaired days experienced by people with CHD and diabetes. Clearly, there is a need to understand the factors that contribute to this large burden of impaired HRQOL.[43] A recent study concluded that depression and anxiety were important factors and social support and locus of control were minor factors influencing HRQOL in patients with coronary artery disease.[44] Future studies may be able to unravel the contributions of disease complications, severity, treatments, and other factors so that rational interventions can be developed to alleviate some of this burden. A better understanding of the determinants of impaired HRQOL among patients with CHD and diabetes should help clinicians assist these patients by addressing modifiable factors. In addition, some evidence suggests that impaired HRQOL may affect aspects of disease management and lifestyle behaviors that may influence the risk for complications.[31]

Gender differences

Reports have suggested that women with CHD have lower HRQOL than men.[4–9] Our results showing that women with CHD report more physically unhealthy days and mentally unhealthy days than men with CHD are consistent with the findings from these other studies. The reasons why women with CHD experience a greater number of impaired HRQOL days compared with men with CHD may relate to differences in the treatment for CHD, the underlying pathophysiology of CHD, the presence of comorbid conditions, health behavioral adaptations, social support, or psychosocial factors.[9,45]

The severity of MI among women is thought to be worse than that among men.[46] Although some studies suggested that the mortality rate among women exceeds that among men,[47,48] other studies have not found such a difference.[49] However, some studies have shown that younger women with an MI may have higher mortality rates than men of a similar age, and African American women have a higher mortality rate than white men.[50,51] Excess mortality among women could indicate the presence of factors that might also adversely affect HRQOL.

Women who have CHD are more likely than men to have such comorbidities as heart failure, diabetes, and hypertension.[51,52] In addition, women with CHD may experience more angina than men.[46] Because all these comorbidities are associated with impaired HRQOL, the higher prevalence of these conditions among women with CHD could explain some of the gender difference in HRQOL among people with CHD. Furthermore, women are less likely than men to be referred to cardiac rehabilitation programs.[53–57] However, evidence linking participation in cardiac rehabilitation to improvements in HRQOL is lacking.[58]

Women who have an MI also have higher levels of depression than men.[59–63] Because depression causes decreased HRQOL, depression could account for some or all the gender difference in HRQOL. In at least one study, gender differences on the Mental Component Summary score of the SF-36 were erased once depression and other factors were accounted for.[64] In that study, however, differences on the Physical Component Summary score remained.

Among women with CHD, several psychosocial factors may affect the disparity in HRQOL between men and women.[65] Women may be less likely to return to work and may receive inadequate counseling about sexual activity following a coronary event. In addition, they may be more socially isolated than men.[66] Furthermore, coping and social support mechanisms may differ between men and women.[67,68]

Despite gender differences in the number of physically unhealthy days and mentally unhealthy days, the number of activity-limitation days was not significantly different between men and women with CHD. These results are consistent with evidence that women underestimate the severity of their cardiac disease[69] and may be resuming disproportionately demanding activities relative to their health status after a cardiac event.[70,71]

Limitations

Several limitations of the present study deserve comment. The BRFSS includes people who have landline telephones. However, the coverage of landline telephones is very high; <2% of U.S. adults lived in households with no telephone service in 2004.[72] Although the increasing use of cellular phones is a growing concern, just 4.5%–5.5% of U.S. adults lived in a household with only wireless service in 2004.[72] Thus, it is unlikely that the exclusion of these households would have had a meaningful impact on our results. Like most telephone surveys, a number of factors (including the advent of such technologies as caller ID, answering machines, and voicemail as well as competition from telemarketers) have put pressure on response rates of telephone surveys, including the BRFSS.[73] Nevertheless, estimates derived from the BRFSS have compared favorably with those from national surveys that were conducted in person and that enjoyed very high response rates.[74,75]

Because the BRFSS is a cross-sectional survey, cause and effect cannot be conclusively determined. Therefore, the BRFSS data cannot establish whether impaired HRQOL predated or postdated the onset of cardiovascular disease. However, the population-based BRFSS data do suggest that people who have cardiovascular disease are characterized by higher levels of impaired HRQOL than are people who do not report having cardiovascular disease.

All data were self-reported and, thus, subject to the various biases inherent in such data. Although a clinical diagnosis of CHD would have been preferable, obtaining such information is simply not practical for a survey the size of the BRFSS. Furthermore, a number of validation studies have suggested that self-reported CHD is reasonably accurate when compared with medical records.[76–78] If the resulting misclassification were random, our odds ratios would have underestimated the true odds ratios.

The results from this study are generalizable to the adult population from 10 states, which cover about 20% of the U.S. population. Details about disease severity, management, or other aspects were not available. We were not able to distinguish participants with type 1 diabetes from those with type 2. Among adults, however, type 2 diabetes is far more prevalent than type 1. In addition, military personnel residing on bases and institutionalized people were excluded, and people with very poor health or functioning may have been unable to participate. Still, it is uncertain that these potential limitations affected our results in a meaningful way.

Implications

Clinicians often assess a myriad of physiological and biochemical parameters to complement

their impressions derived from the history and physical examination in arriving at a diagnosis and monitoring the impact of their management on their patients. Measuring a patient's HRQOL can provide additional information about a patient's need for treatment, information to help optimize treatment, and information about a patient's prognosis.[79] Furthermore, measuring QOL could provide feedback to patients about the possible benefits of their treatments.[80] The large number of impaired HRQOL days among women with both CHD and diabetes suggests that clinicians should be especially vigilant in uncovering contributing factors among these women.

CONCLUSIONS

Using a reliable and valid brief HRQOL questionnaire, we showed that people with CHD experienced significantly lower HRQOL than people without this condition. People who had both CHD and diabetes had especially impaired HRQOL. A higher percentage of women with CHD reported experiencing ≥14 physically unhealthy days and ≥14 mentally unhealthy days than men with CHD. Furthermore, the difference between the percentage of participants with CHD and the percentage of participants without CHD reporting impaired HRQOL tended to be larger among women than men. However, the associations between CHD and impaired HRQOL did not differ significantly by gender. The use of disease-specific and generic instruments may be valuable in monitoring aspects of HRQOL among people with CHD alone or CHD plus diabetes.[81]

DISCLOSURE STATEMENT

No conflicting financial interests exist.

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Address reprint requests to:
Earl S. Ford, M.D., M.P.H.
Centers for Disease Control and Prevention
4770 Buford Highway, MS K66
Atlanta, GA 30341

E-mail: eford@cdc.gov