Prevalence of Erectile Dysfunction and Active Depression: An Analytic Cross-Sectional Study of General Medical Patients

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Erectile dysfunction is a common problem, affecting more than half of all men between the ages of 40 and 70 years. The authors' goal was to quantify the prevalence of concomitant erectile dysfunction and active depression among patients seen in a general medical setting between September 1998 and September 1999. Simple random sampling techniques were used to select a subset of 334 patients from 73 general medical practices affiliated with an academic tertiary referral center in Pennsylvania. Of the 334 patients sampled, the authors received responses from 268 subjects (80.2%) and completed questionnaires from 199 subjects (59.6%) with a mean age of 59 years. The survey instrument consisted of three major sections: demographic and health history information, the Center for Epidemiologic Studies Depression (CES-D) Scale, and the five-item version of the International Index of Erectile Function Scale. The prevalence of moderate or complete erectile dysfunction in this sample was 36.4% (95% confidence interval (CI): 29.6, 43.1). The prevalence of current depression by CES-D Scale criteria was 12.1% (95% CI: 7.5, 16.7), and the prevalence of concomitant erectile dysfunction and depression was 5.1% (95% CI: 2.0, 8.1). Using logistic regression, the authors found that current depressive symptoms were not associated with moderate or complete erectile dysfunction (odds ratio = 1.3, 95% CI: 0.5, 3.1; p = 0.565). Concomitant erectile dysfunction and depression represent a significant public health problem.

Abbreviations: CES-D, Center for Epidemiologic Studies Depression; CI, confidence interval; IIEF-5, five-item version of the International Index of Erectile Function; MMAS, Massachusetts Male Aging Study.

Erectile dysfunction is a common problem, affecting more than half of all men between the ages of 40 and 70 years (1–7). Erectile dysfunction has been defined by the National Institutes of Health Consensus Panel on Impotence as the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance (8). A number of population-based studies have estimated that about one third to one half of all men aged 40 or more years have erectile dysfunction, and these studies have all shown a strong relation between age and the prevalence of erectile dysfunction (1, 4–6, 9–14). Erectile dysfunction has also been associated with numerous medical conditions, including depression (15–17).

Depression is a major public health problem, especially in individuals over the age of 65 years (18–21). Studies have suggested that the prevalence of major depression among elderly people is between 1 and 5 percent, with significant depressive symptoms in 8–27 percent of community-dwelling elderly persons (22). Many scales may be used to measure depression and depressive symptomatology, although most studies evaluating depression in community or general medical populations have utilized the Center for Epidemiologic Studies Depression (CES-D) Scale (23–25).

Several studies have addressed the relation between erectile dysfunction and depression. The Massachusetts Male Aging Study (MMAS) found that the probability of erectile dysfunction in subjects with the most severe depression (as measured using the CES-D Scale) was approximately 90 percent, while the probability of erectile dysfunction was only 25 percent in the least depressed group (1). The authors

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also found a significant association between erectile dysfunction and depressive symptomatology using the CES-D Scale. Another MMAS analysis found that men with depressive symptoms were not more likely to develop erectile dysfunction than their nondepressed counterparts (26). A study of patients seen in a single urology practice found that erectile dysfunction was significantly associated with depressive symptoms (27). These findings suggest that there may be an association between erectile dysfunction and depression, although the limitations of these earlier studies, particularly their generalizability to the larger population of men seen by physicians, mandate further study.

The goal of our study was to quantify the prevalence of concomitant erectile dysfunction and active depressive symptomatology (depression) among patients seen in a general medical population. We conducted a cross-sectional study to assess the point prevalence of erectile dysfunction and depression both individually and in combination within a population of patients seeking care from a primary health care provider.

MATERIALS AND METHODS

Population and patient selection

We studied a simple random sample of male patients aged 18 or more years seen within the preceding 3 months at any of the outpatient medical practices affiliated with our academic tertiary referral center. These practices include a mix of university-based clinical practices and community medical practices that are loosely affiliated with the academic center. A total of 86,536 men aged 18 or more years were seen in these practices between September 1998 and September 1999.

Simple random sampling techniques were used to select a subset of 334 patients from the 73 general medical practices that are affiliated with the academic medical center (28). This sample size was used with the expectation of a 50 percent response rate and designed so that the 95 percent confidence intervals around our estimate of the prevalence of concomitant erectile dysfunction and depression would be ±10 percent.

Survey instrument

The survey instrument consists of three major sections: demographic and health history information (including data on the presence or absence of risk factors for erectile dysfunction), the CES-D Scale, and the five-item version of the International Index of Erectile Function (IIEF-5) Scale (29–31). We also included a single question regarding erectile dysfunction based directly on the National Institutes of Health Consensus Conference definition of erectile dysfunction (8).

Erectile dysfunction status

The severity of erectile dysfunction was determined using the IIEF-5 Scale, a five-question, validated measure of erectile dysfunction (31, 32). A score of less than 12 on the IIEF-5 Scale was used to classify a patient as having moderate or complete erectile dysfunction (32). Those with a score greater than or equal to 12 were classified as having mild or no erectile dysfunction. This dichotomization is consistent with National Institutes of Health guidelines for the definition of erectile dysfunction (33, 34). The severity of erectile dysfunction was also measured using a single self-assessment question that has been used in other studies of the epidemiology of erectile dysfunction (35).

Depression

Patients were dichotomized into those who were depressed or not depressed based on the exhibition of depressive symptomatology using the CES-D Scale. The CES-D Scale is a validated screening tool that has been used in numerous studies to assess community populations for depressive symptoms (22, 24, 25, 36). Because a diagnosis of depression is clinical and must be made by a physician, no scale can supplant a clinical diagnosis; however, that is impractical in an epidemiologic study. Scores may range from 0 to 60, with higher scores indicating increasing levels of depressive symptoms. A score of 16 or more was used to classify a patient as depressed. This cutoff is consistent with prior studies that have used the CES-D Scale as a screening tool for depression in general medical populations (22, 37).

Other baseline characteristics assessed

Erectile dysfunction has been associated with numerous medical conditions, including diabetes, depression, hypertension, dyslipidemia, and benign prostatic hypertrophy (10, 15, 17, 33, 35, 38–40). This condition has also been associated with chronic renal failure, liver failure, multiple sclerosis, chronic obstructive pulmonary disease, and obesity (41–47). The study questionnaire included questions regarding these medical conditions. Subjects were asked if they had ever been told by a physician that they had any of the medical conditions listed above. Additionally, they were asked whether they had ever been told that they had human immunodeficiency virus or acquired immunodeficiency syndrome, incontinence, prostate or other cancers, or Alzheimer’s or other dementias.

Patients were given a list of medications and color pictures of medications used to treat erectile dysfunction, including sildenafil, yohimbine, and injectable or urethral alprostadil, and asked to circle any medications that they had used.

Patients were asked about their current consumption of alcoholic beverages and use of cigarettes. They were asked a series of questions that address the frequency, quantity, and type of alcoholic beverages consumed, as well as the number of cigarettes smoked and current and past smoking patterns. This questioning methodology is consistent with previous studies (37, 43, 48).

Survey methodology

The questionnaire was pilot tested on a cohort of 30 consecutive male patients aged 18 or more years seen at two practices (one a family practice and the other a general practice).
Statistical analyses

Primary analysis of prevalence. We utilized one-way analysis of variance to determine whether characteristics of the final analysis sample, the group that returned blank questionnaires (refused group), and the nonrespondents differed significantly. We then used the Scheffé multiple-comparison procedure to determine which means varied significantly. The prevalence of erectile dysfunction was determined directly from the data, and normal-theory method 95 percent confidence intervals were calculated. The prevalence of erectile dysfunction was calculated using the following formula: estimated prevalence of erectile dysfunction = \( \hat{p} = \frac{n}{N} \), where erectile dysfunction is defined by the IIEF-5 Scale criteria as noted above and \( n \) is the total number of completed questionnaires. This number represents an estimate of the prevalence of erectile dysfunction in a population of general medical patients. The prevalences of active depressive symptomatology and concomitant erectile dysfunction and active depression were calculated similarly. The prevalence of erectile dysfunction was also calculated using the single-question method, as discussed above.

Association between erectile dysfunction and depression. Univariate and multivariate logistic regressions were used to further examine the association between depression and erectile dysfunction. The association between erectile dysfunction and depression was assessed using logistic regression odds ratios. Because our data are cross-sectional, we report prevalence odds ratios with 95 percent confidence intervals (51).

The relation between depression and erectile dysfunction was explored further by utilizing the raw score from the CES-D Scale as a continuous measure of the degree of depression. Logistic regression was utilized to determine whether the CES-D Scale score (as a measure of severity of depression) was associated with erectile dysfunction.

We then stratified our prevalence estimate by age and computed the stratum-specific prevalence of erectile dysfunction with 95 percent confidence intervals (52). We used univariate logistic regression to determine whether statistically significant associations exist between erectile dysfunction and potential confounders and between depression and potential confounders. We also evaluated whether concomitant erectile dysfunction and depression were associated with any of the individual confounders. Variables significantly associated with both erectile dysfunction and depression were classified as potential confounders, because they are associated with both the outcome of interest (erectile dysfunction) and the exposure of interest (depression) in our secondary analyses.

RESULTS

Primary analysis

Of the 334 patients sampled, we received responses (including blank questionnaires) from 268 subjects (80.2 percent) and completed questionnaires from 199 subjects (59.6 percent). Demographic characteristics of respondents are included in table 1, and selected characteristics of nonrespondents, those who returned blank questionnaires, and the analysis sample are included in table 2. Using one-way analysis of variance, we found that only subject age varied significantly between groups (\( p = 0.0002 \)), with nonrespondents being younger than patients who completed the questionnaire (the analysis sample) and those who returned blank questionnaires (refused group). The age difference was significant between the analysis sample and nonrespondents (\( p = 0.001 \)) and between the refused group and the nonrespondents (\( p = 0.001 \)) using the Scheffé multiple-comparison procedure. The percentage of patients who are African American and who have previously been diagnosed with erectile dysfunction or depression on the basis of medical billing records did not differ significantly between groups.

The prevalence of moderate or complete erectile dysfunction in our sample was 36.4 percent (95 percent confidence interval (CI): 29.6, 43.1). Using the single-question screen for erectile dysfunction, we found the prevalence of moderate or complete erectile dysfunction to be 39.6 percent (95 percent CI: 32.6, 46.9). The prevalence of current depression by CES-D Scale criteria was 12.1 percent (95 percent CI: 7.5, 16.7), and the prevalence of concomitant erectile dysfunction and depression was 5.1 percent (95 percent CI: 2.0, 8.1). The results of stratifying the prevalence estimates of erectile dysfunction, depression, and concomitant erectile dysfunction and depression by age are shown in table 3.

Association between erectile dysfunction and depression

Using logistic regression, we found a positive association between moderate or complete erectile dysfunction and age, diabetes, benign prostatic hypertrophy, prostate cancer, and
incontinence. There was a negative relation between moderate or complete erectile dysfunction and being in a sexual relationship. We also found a positive relation between current depression by CES-D Scale criteria and having ever had a diagnosis of chronic obstructive pulmonary disease. There was a negative relation between current depression and currently being married.

Using logistic regression, we found that current depressive symptoms as defined by the CES-D Scale were not associated with moderate or complete erectile dysfunction (prevalence odds ratio = 1.3, 95 percent CI: 0.5, 3.1; \( p = 0.565 \)). We also found that age, current marriage, history of diagnosis of depression, myocardial infarction, diagnosis of coronary heart disease, diagnosis of chronic obstructive pulmonary disease, and diagnoses of prostate cancer and incontinence were all associated with a greater than 15 percent change in the point estimate of the odds ratio of association between erectile dysfunction and depression. Therefore, these variables (with the exception of past depression) were included in our fully adjusted logistic model.

The fully adjusted prevalence odds ratio estimate of the association between erectile dysfunction and depression was 1.2 (95 percent CI: 0.4, 3.8; \( p = 0.822 \)). The actual score on the CES-D Scale (treated as a continuous variable) was not associated with the presence of moderate or complete erectile dysfunction (\( p = 0.305 \)).

**DISCUSSION**

This is the first study to report the prevalence of erectile dysfunction and depression among patients seen in a general medical setting using mailed questionnaires. Earlier studies relied on questionnaires distributed at general medical practices, community samples that failed to reflect the race and age distributions of patients seen by physicians, or a subset of patients seen by urologists (13, 27). The generalizability of their findings to all patients seen in a general medical setting may therefore be limited.

We found that the prevalence of moderate or complete erectile dysfunction in our sample population was 36.4 percent (95 percent CI: 29.6, 43.1), the prevalence of significant depressive symptomatology was 12.1 percent (95 percent CI: 7.5, 16.7), and the prevalence of concomitant erectile dysfunction and depression was 5.1 percent (95 percent CI: 2.0, 8.1). These findings suggest not only that erectile dysfunction and depression represent a significant public health problem individually but also that a significant number of patients have both disorders simultaneously. General medical patients may be reluctant to approach their physician about either topic, given the sensitivities of both. Physicians may wish to question their patients carefully to screen for these common conditions.

Our findings regarding the prevalence of erectile dysfunction reflect results of several previous studies. The MMAS, utilizing a large community sample, found the prevalence of moderate or severe erectile dysfunction to be 35 percent (1). A study examining the prevalence of erectile dysfunction among men aged 50–76 years in rural New York State found the prevalence of erectile dysfunction to be between 21 percent and 46 percent (2). Finally, an Australian study found that 39 percent of patients reported some erectile dysfunction (13). These studies all noted that the prevalence

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**TABLE 2. Selected baseline characteristics (with 95% confidence intervals) of the analysis sample group, the group of patients who returned blank questionnaires (refused group), and those who failed to respond at all (nonrespondents), Pennsylvania, 1998–1999**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Analysis sample (n = 199)</th>
<th>95% CI*</th>
<th>Refused group (n = 69)</th>
<th>95% CI</th>
<th>Nonrespondents (n = 66)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)†</td>
<td>59</td>
<td>57.61</td>
<td>61</td>
<td>57.64</td>
<td>51</td>
<td>47.55</td>
</tr>
<tr>
<td>African American (%)</td>
<td>18.1</td>
<td>13.0, 24.2</td>
<td>20.3</td>
<td>11.6, 31.7</td>
<td>28.8</td>
<td>18.3, 41.3</td>
</tr>
<tr>
<td>Previous diagnosis of erectile dysfunction (%)</td>
<td>5.0</td>
<td>2.4, 9.0</td>
<td>1.4</td>
<td>0.7, 8.1</td>
<td>6.1</td>
<td>1.7, 14.8</td>
</tr>
<tr>
<td>Previous diagnosis of depression</td>
<td>3.0</td>
<td>1.1, 6.4</td>
<td>4.3</td>
<td>0.9, 12.2</td>
<td>4.5</td>
<td>0.9, 12.7</td>
</tr>
</tbody>
</table>

* CI, confidence interval.
† With one-way analysis of variance, only subject age varied significantly between groups (\( p = 0.0002 \)). The age difference was significant between the analysis sample and nonrespondents (\( p = 0.001 \)) and between the refused group and the nonrespondents (\( p = 0.001 \)) using the Scheffé multiple-comparison procedure.
TABLE 3. Prevalence of erectile dysfunction based on the IIEF-5,* depression, and concomitant erectile dysfunction and depression stratified by age with 95% confidence intervals, Pennsylvania, 1998–1999

<table>
<thead>
<tr>
<th>Age stratum (years)</th>
<th>Prevalence of erectile dysfunction (%)</th>
<th>95% CI*</th>
<th>Prevalence of depression (%)</th>
<th>95% CI</th>
<th>Prevalence of concomitant erectile dysfunction and depression (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–40 (n = 23)</td>
<td>13.0</td>
<td>2.8, 33.6</td>
<td>13.0</td>
<td>2.8, 33.6</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>41–50 (n = 29)</td>
<td>3.4</td>
<td>0.1, 17.8</td>
<td>17.2</td>
<td>5.8, 35.8</td>
<td>3.4</td>
<td>0.1, 17.8</td>
</tr>
<tr>
<td>51–60 (n = 45)</td>
<td>28.9</td>
<td>16.4, 44.3</td>
<td>6.7</td>
<td>1.4, 18.3</td>
<td>4.4</td>
<td>0.5, 15.1</td>
</tr>
<tr>
<td>61–70 (n = 48)</td>
<td>41.7</td>
<td>27.6, 56.8</td>
<td>14.6</td>
<td>6.1, 27.8</td>
<td>6.3</td>
<td>1.3, 17.2</td>
</tr>
<tr>
<td>&gt;70 (n = 53)</td>
<td>66.0</td>
<td>51.7, 78.5</td>
<td>11.3</td>
<td>4.3, 23.0</td>
<td>7.5</td>
<td>2.1, 18.2</td>
</tr>
<tr>
<td>Overall estimate (n = 198)</td>
<td>36.4</td>
<td>29.6, 43.1</td>
<td>12.1</td>
<td>7.5, 16.7</td>
<td>5.1</td>
<td>2.0, 8.1</td>
</tr>
</tbody>
</table>

* IIEF-5, five-item version of the International Index of Erectile Function; CI, confidence interval.

of erectile dysfunction increased with increasing age. We found the prevalence of current depressive symptoms in our population to be 12.1 percent. The MMAS reported that the prevalence of significant depressive symptoms in the community population was approximately 12 percent (1). Another study using prospective results from the MMAS found that depressive symptoms had a prevalence of approximately 9 percent (26). Likewise, studies evaluating the prevalence of depressive symptoms in elderly populations have reported numbers ranging from 8 percent to 27 percent (22).

Unlike researchers from earlier studies (1, 27), we did not find a statistically significant association between erectile dysfunction and depression. This could be secondary to differences in population. One earlier study that found a significant association included only patients seen in a urology practice (27). This subset of patients with erectile dysfunction that requires intervention by urologists may be more prone to depression than patients with moderate or complete erectile dysfunction seen by community physicians.

The MMAS also found a significant association between erectile dysfunction and depressive symptomatology (1). The authors found an adjusted odds ratio of 1.82 for the association between erectile dysfunction and depression. Again, this may be due to a different population and mode of assessing erectile dysfunction. This study was based on a community sample of men, and it did not utilize the IIEF-5 Scale to assess erectile dysfunction. The point estimate for the association between erectile dysfunction and depression in our study was 1.3. As a trend, it may be similar to that of the MMAS, although the magnitude of the association observed in both studies may be exaggerated because we utilize the odds ratios of association rather than the relative risk, and the outcome of interest is common. Our failure to find a statistically significant association may have been secondary to sample size constraints, as our study was not powered to perform this secondary statistical analysis. Although our failure to find a statistically significant association between erectile dysfunction and increasing severity of depressive symptomatology using the absolute CES-D Scale score underscores our negative findings, it is possible that this, too, was secondary to sample size limitations.

Our failure to find an association between erectile dysfunction and depression may be secondary to other reasons as well. It is possible that depressed patients or those with significant depressive symptoms are less likely to report symptoms of erectile dysfunction when asked in a questionnaire, because they may focus less on erectile function than nondepressed individuals do. Given that previous studies have utilized similar self-reported measures of erectile function (27), this would not explain why our findings differ from those of earlier studies. Moreover, given a tendency to exaggerate the negative aspects of a situation that may be seen with depression, depressed individuals might overreport symptoms of erectile dysfunction also. In addition, it is possible that depressed patients are less likely to be seen in primary care practices or are less likely to complete the questionnaire than their nondepressed counterparts. This is unlikely, since we found the prevalence of depressive symptomatology to be similar to that of previous studies that have examined community populations (22). We also found that the proportions of respondents and nonrespondents who had previously received erectile dysfunction or depression billing codes were similar, suggesting that—if these codes represent a marker of the prevalence of these disorders—depressed patients were not less likely to complete the questionnaire than their nondepressed counterparts. This is unlikely, since we found the prevalence of depressive symptomatology to be similar to that of previous studies that have examined community populations (22). We also found that the proportions of respondents and nonrespondents who had previously received erectile dysfunction or depression billing codes were similar, suggesting that—if these codes represent a marker of the prevalence of these disorders—depressed patients were not less likely to complete the questionnaire. Billing codes may not be a definitive measure of erectile dysfunction or depression because of inherent problems with coding, physician reluctance to code for socially sensitive disorders, or the dynamic nature of erectile dysfunction and depression (so that a patient may be diagnosed with either disorder but also be receiving psychotherapy and have few symptoms). Thus, although the lack of a differential response by patients who have or have not received these codes is reassuring, there may still be significant differences in the populations that are not captured by using these billing codes.

Using a stratified analysis, we found that erectile dysfunction appears to be strongly age dependent (table 3), and this finding is consistent with those of prior studies (4, 9, 12–14, 35, 54). Depression failed to show a strong age dependence, and concomitant erectile dysfunction and depression similarly were not age dependent. Our finding that concomitant erectile dysfunction and depression were not age dependent, even though erectile dysfunction demonstrated a strong age...
dependence, is likely due to the small number of patients that had both erectile dysfunction and depression (n = 9).

This study has several limitations. The generalizability of our findings may be limited, because we are studying only patients seen at practices affiliated with an academic referral center, and there is no guarantee that this population resembles the total population of patients seen by primary care providers nationwide. Still, the large number of practices from which these patients were drawn, over a broad geographic and socioeconomic area and using simple random sampling, suggests that the generalizability of our findings to other patients seen in general medical settings is likely adequate. The fact that our study sample included a significant number of African-American patients (in contrast to previous studies that have evaluated erectile dysfunction and depression) also provides greater generalizability. Still, our very inclusion of African-American patients raises a separate concern regarding the validity of the CES-D Scale and the IIEF-5 Scale in an African-American population. This has not been well studied and is an area in need of further research.

As an analytic cross-sectional study, this study assessed the prevalence of concomitant erectile dysfunction and depressive symptomatology. Causation cannot be determined from this study, because both exposure (depression) and disease status (presence or absence of erectile dysfunction) are measured at the same point in time. Therefore, we cannot determine whether the exposure preceded the disease and, indeed, this was not an aim of our study. It is possible that this cross-sectional approach may have limited our ability to detect a significant association between erectile dysfunction and depression. We did not elicit a comprehensive medication history from study participants, and we asked only about medications that are used to treat erectile dysfunction. It is possible, therefore, that some commonly used medications may lead to confounding. Although we report results from using an adjusted logistic regression model, the small sample size of our study limits our power to evaluate some of these associations. Moreover, the event-per-variable ratio of this analysis is low, which may compromise our ability to correctly model these relations (55, 56).

Our goal was to evaluate the prevalence of erectile dysfunction and depression in this population. Some of the patients included in this study were already using medications to treat erectile dysfunction, depression, or both. For the purposes of our primary analysis, we did not address the impact of these medications on the prevalence of erectile dysfunction or depression, because our aim was to use a questionnaire to evaluate prevalent erectile dysfunction and depression. Thus, someone being successfully treated for erectile dysfunction would have been categorized as not having erectile dysfunction. It is, therefore, possible that we underestimated the underlying prevalence of erectile dysfunction and depression when patients were being treated with medications. Although this does represent a limitation, our primary study question related not to the underlying prevalence of these disorders but rather to the more practical question of the prevalence of active erectile dysfunction and depression among patients who may present to a general medical practice and may be in need of intervention; because patients already treated effectively would not evince evidence of erectile dysfunction or depression at presentation, it is appropriate that they should not be classified as such for the purposes of our study.

Finally, an important limitation of this study is the potential for bias introduced by patients’ self-selection to respond to our survey, or selection bias. This is a problem inherent in any survey-based study, and it is particularly difficult to control for when studying diseases such as erectile dysfunction and depression, both of which are associated with social stigmas. We were able to examine baseline characteristics of patients who responded with completed surveys, responded with blank surveys, and failed to respond at all. Nonrespondents were significantly younger than patients who responded with either completed surveys or blank questionnaires, but we did not find any significant difference when examining the percentage of patients who had received billing diagnoses of depression and erectile dysfunction in the past or the percentage of patients who are African American. This argues that, although our population itself may be weighted with older patients, it is unlikely that patients with or without erectile dysfunction or depression were differentially more or less likely to respond to the survey (assuming that billing codes for depression and erectile dysfunction are meaningful for this purpose). Given that erectile dysfunction is known to be associated with age (9, 14), a finding confirmed in our study, it is possible that we may have overestimated the overall prevalence of erectile dysfunction among patients aged 18 or more years seen in a general medical setting because our study was weighted with older patients. Our age-stratified estimates of the prevalence of erectile dysfunction, however, should reflect the true prevalence of this condition within each age stratum. Our ability to evaluate these baseline characteristics is a significant advantage, as none of the earlier studies evaluating erectile dysfunction and depression had access to detailed baseline information on respondents and nonrespondents.

In conclusion, we found that approximately 5.1 percent of the patients seen in a general medical setting have concomitant erectile dysfunction and significant depressive symptomatology. Although we did not find a significant statistical association between erectile dysfunction and depressive symptomatology, we could better assess this question by utilizing a larger sample size and a longitudinal methodology. Importantly, investigating a potential association between erectile dysfunction and depression was not a primary aim of our study. We present a risk assessment model that may serve to promote future research in this area, particularly as treatments exist for both erectile dysfunction and depression. Both of these disorders are also marred by social stigmas and therefore patients may be less than forthcoming when discussing them with their physicians. Therefore, providing a tool to enable health care providers to better assess which patients are likely to have erectile dysfunction may help to focus diagnostic and treatment efforts on the subset of patients most likely to be experiencing this disorder.

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REFERENCES


18. D’Asth P, Katona P, Mullan E, et al. Screening, detection and management of depression in elderly primary care attenders. I. The acceptability and performance of the 15 item Geriatric Depression Scale (GDS15) and the development of short ver-