Are Gender Effects Being Neglected in Schizophrenia Research?

by Otto F. Wahl and Jacquelyn Hunter

Abstract

Research on schizophrenia published in four professional journals—Journal of Abnormal Psychology, Archives of General Psychiatry, Journal of Nervous and Mental Disease, and American Journal of Psychiatry—over a 5-year period from January 1985 through December 1989 was examined for gender composition of subject samples and gender analyses of findings. Results indicate a continued predominance of male subjects in schizophrenia research, with males outnumbering females two to one, and frequent neglect of possible gender differences within mixed-sex samples. Possible explanations for the male bias are considered and greater research and editorial attention to possible gender effects are urged.

There is increasing evidence that for schizophrenia as for many other phenomena, gender is an important factor to be considered. Lewine (1981), in a review of the literature concerning gender differences among schizophrenic patients, concluded that there is substantial research suggesting different patterns of onset, course, and symptomatology between males and females with schizophrenia. In particular, Lewine reported consistent findings that males have poorer premorbid adjustment, are hospitalized at an earlier age, and are more likely to show "negative" and typical (vs. florid and atypical) symptoms than their female counterparts. In a recent issue of Schizophrenia Bulletin devoted to the issue of gender and schizophrenia (Vol. 16, No. 2, 1990), numerous studies similarly suggested significant gender differences: differences in premorbid functioning, onset and course, symptomatology, treatment response, and even brain morphology (Angermeyer et al. 1990; Chil- ders and Harding 1990; Flor-Henry 1990; Goldstein et al. 1990; Lewine et al. 1990; McGlashan and Bardenstein 1990). These findings led Goldstein and Tsuang (1990, p. 181) to conclude, in their overview of this issue, that studies "present a compelling argument for gender as an important factor in understanding the heterogeneity of schizophrenia."

Consideration of possible gender differences should not be confined to studies specifically focused on such differences, however. It is almost axiomatic in social science research that studies involving both male and female subjects should be analyzed separately by gender to determine the possible impact of gender differences (Carlson and Carlson 1960). With the accumulating evidence that male and female schizophrenic individuals are not alike, it is clear that the axiom of analyses of research results by gender must apply to schizophrenia research as well. As McGlashan and Bardenstein (1990, p. 319) conclude, research results "highlight the importance of analyzing data by gender in studies of the psychotic disorders."

As sensible as this observation is, it has not always been followed in schizophrenia research. Wahl (1977), for example, examined the published research on schizophrenia in three major journals (Journal of Abnormal Psychology, Archives of General Psychiatry, and Journal of Nervous and Mental Disorders) over a 2½-year period from January 1974 to
August 1976 and found that few of the studies of schizophrenia analyzed results by gender. A substantial proportion of the studies, in fact, failed even to specify the gender composition of the subjects. Moreover, Wahl found an overabundance of males in schizophrenia studies; male subjects outnumbered females, almost 2 to 1 in some cases. It appeared that at that time possible gender differences were being largely ignored and that findings on predominantly male schizophrenic patients were being used to represent schizophrenic patients in general.

It is possible that such findings and the mounting evidence of gender differences among schizophrenic individuals have led to greater inclusion of female schizophrenic subjects and more routine analysis of possible gender effects. The purpose of the present study was to repeat the Wahl (1977) examination of published research on schizophrenia to determine the extent to which gender differences are—or still are not—being considered in current research involving schizophrenic subjects.

Methodology

To identify journals frequently publishing schizophrenia research, we selected a recent issue of *Schizophrenia Bulletin* (Vol. 14, No. 4, 1989) and examined the reference lists of the articles in that issue. We then selected the top four U.S. journals (apart from *Schizophrenia Bulletin* itself, since it tends to publish conceptual and review articles rather than original research) in terms of number of citations. Those four journals were, in order of citation frequency, *Archives of General Psychiatry, American Journal of Psychiatry, Journal of Abnormal Psychology*, and *Journal of Nervous and Mental Disease*.

For each of the four journals, articles reporting schizophrenia research during a 5-year period from January 1985 to December 1989 were examined. Studies of people genetically related to schizophrenic patients, including children-at-risk studies, were not included because the subjects involved were merely relatives of people with schizophrenia. Also excluded were studies that used psychiatric patients in general, some of whom had schizophrenia; reviews of previously reported schizophrenia studies; epidemiologic studies that merely identified schizophrenic individuals; and research involving post-mortem studies of the brains of schizophrenic patients. For each study the following data were noted: total number of schizophrenic subjects used; source of the schizophrenic sample (e.g., Veterans Affairs hospital, outpatient clinic); whether or not gender composition of the subject sample was reported; when reported, number of male and number of female schizophrenic subjects used; whether the study employed exclusively male or exclusively female schizophrenic subjects; and whether there was any analysis of results by gender.

Results

As shown in table 1, the total number of qualifying studies of schizophrenia in the four target journals across the 5-year period studied was 198; *American Journal of Psychiatry* had the most articles (67) and *Journal of Abnormal Psychology* the fewest (24). Data in this table suggest a continued male skew in subject samples. Almost three-quarters of these studies employed more male than female subjects, while only about 8 percent had more females than males. Similarly, there were 49 studies employing all-male samples and only 1 in which subjects were exclusively female. In addition, table 1 shows relatively little methodological or statistical consideration of possible gender effects on results. Approximately 1 in 6 studies failed to indicate the gender composition of the sample and, of the 115 studies that reported mixed samples of males and females, only 42 (37%) also reported any analysis of results by gender.

Consideration of the numbers of males and females in the studies examined confirms the preponderance of male subjects. Among the 165 studies specifying the sex composition of their samples, males outnumbered females more than 2 to 1 (5,180 vs. 2,311). Even when we take out those studies using males only, there remain 1½ times as many males as females (3,604 vs. 2,311). Moreover, the preponderance of male over female schizophrenic subjects was apparent regardless of the journal examined; male-to-female ratios ranged from 1½:1 to 3:1 in the four journals.

Using many of the same journals as in the Wahl (1977) study permits us to make some comparisons across time and to see what, if anything, has changed in the patterns being considered. The number of articles in the journals, particularly the *Journal of Abnormal Psychology*, on schizophrenia research has greatly decreased; that difference, however, is unrelated to gender patterns and is not discussed here. Several pertinent changes are apparent. First of all, the male skew is even more prominent in current research than 14 years ago, both in proportion of studies with greater numbers of males (37% in 1977 vs. 73% in the
current study for the same three journals) and in absolute numbers of males and females (59% male in 1977 vs. 67% male in the current study for the same three journals). In addition, while the previous study found the male subject skew to be mainly characteristic of the Journal of Abnormal Psychology, all three journals show pronounced male skew in the current study. On the other hand, there did seem to be more attention in current publications to gender and gender analysis; a lower percentage of studies than in 1977 failed to report sex composition (34% in 1977 vs. 17% in the current study) and a higher percentage considered possible gender differences in their reporting (8% in 1977 vs. 21% in the current study).

Discussion

A clear male bias in selection or involvement of schizophrenic subjects in research is evident. Researchers working with single-sex samples are far more likely to choose all-male than all-female samples, and even in studies with mixed samples, many more males than females are typically included. Moreover, this pattern is uniform across several different journals in which schizophrenia research is commonly found and has persisted since at least 1974, as indicated by the similar Wahl (1977) results.

A number of explanations for this male excess can be considered. First of all, numerous studies have indicated that females and males differ in their patterns of onset of and recovery from schizophrenia; males have their first admission at younger ages than females and women have fewer and shorter hospitalizations than men (Lewine 1981; Angermeyer et al. 1990; Flor-Henry 1990). This different pattern of onset and recovery may lead to different availability of males and females from inpatient units. It is possible, then, that studies taking samples from such inpatient settings, as most of the studies examined did, will have more males than females from which to recruit and thus end up with disproportionate numbers of male subjects. This possibility would be even more likely if age criteria are used in defining the sample. Male schizophrenic patients outnumber females before the age of 40, but the reverse is true after age 45 (Flor-Henry 1990). Thus, studies that limit their samples to younger, acute-onset schizophrenic subjects may end up with more males.

Male-female subject ratios may also be affected by diagnostic criteria. It has been established that stricter criteria for schizophrenia favor selection of schizophrenic males (Lewine et al. 1984; Westermeyer and Harrow 1984). The current trend (e.g., the move from DSM-II to DSM-III-R; American Psychiatric Association 1968, 1987) is certainly toward stricter criteria; research criteria are sometimes even more conservative. Use of such strict criteria, then, may help account for the excess of males in current studies. Although such an excess was apparent even in the parallel 1977 study, well before the introduction of DSM-III (American Psychiatric Association 1980), the changed diagnostic criteria may help to account for the even
greater excess found in the current study than in the earlier one. It is possible, too, that our data and the greater numbers of males that show up with newer criteria (which presumably describe the disorder more accurately) reflect an actual male skew in schizophrenia. It is possible that Kraepelin’s early (1919/1971) suggestion that schizophrenia is predominantly a disorder of young men was correct and that when strict criteria are carefully applied, as in research, a male skew is unavoidable.

Research has also shown behavioral or symptomatologic differences between male and female schizophrenic subjects: females show more florid, positive, and affective symptoms, and males show more passive or negative symptomatology (Wahl and Herzog 1980; Lewine 1981; Goldstein and Link 1988). It is possible, as Wahl (1977) argued, that these behavioral differences make female schizophrenic individuals more willing or able to participate in research—that is, to give informed consent and to attend adequately to research tasks. It may be also that the negative symptoms of males make them less troublesome and therefore more attractive as research subjects.

Still another explanation often given for selection of male over female subjects has to do with the potential confounding effects of pregnancy, menstrual cycle, and contraceptive drugs on biologic interventions and measurement. It is possible, then, that preference for males in drug treatment studies of schizophrenia may have contributed to the male skew. However, separation of studies into drug and nondrug studies did not support this explanation. Only 36 of the 198 studies were drug studies. Although they did show a somewhat greater male skew than the total sample (77% vs. 69% male), the exclusion of drug studies from our counts produced little change in the overall outcome. Males in studies not involving drugs still greatly outnumbered females (67% to 33%).

It could also be argued that the predominance of males in schizophrenia research is a reflection of broader male biases in our society—or among the researchers involved in the published studies examined (who were themselves predominantly male)—that is, the predominance of males in schizophrenia research reflects that males are valued more highly in our society or that male researchers are more comfortable with male subjects. Moreover, the finding of uneven numbers of males and females in schizophrenia does not mean that this finding is specific to schizophrenia. It may be part of a larger pattern that occurs with many psychiatric disorders, or part of an even broader trend that involves health care research in general. Medical research has certainly received considerable adverse publicity recently concerning neglect of females in some of its research. For example, recent U.S. Government testimony has acknowledged that the National Institutes of Health has been lax in applying its own policy of requiring adequate female subject representation as part of its grant review criteria, thereby resulting in studies that still have all or mostly male participants (U.S. General Accounting Office 1990). Although some disorders do have significant gender differences in their base rates, thereby providing some justification for gender-skewed research samples, the expressed concern is that females have been neglected in medical research even when compelling prevalence rate differences are absent. Cotton (1990, p. 1050), for example, has criticized medical research in general as focusing too much on middle-aged white men merely because they are the “most simple, homogeneous sample,” and Time magazine has noted also the absence of females in large-scale studies of medical problems that afflict women as well as men (Purvis 1990a, 1990b).

Whatever the explanations, however, the end result is a significant overrepresentation of males in schizophrenia research—a bias that has persisted for at least 15 years—and knowledge of schizophrenia that really knowledge of male schizophrenia. To the extent that female subjects with schizophrenia may differ in important ways from the male subjects of such studies, this male-dominated research at best leaves a knowledge gap about females with schizophrenia and, at worst, creates false expectations about them. In addition, our findings indicate that, even when female subjects are included in study samples, there is often no attention to possible gender differences. Despite the expanding literature on differences of all kinds between males and females with schizophrenia, fewer than half the studies using both males and females made any mention of analyses by gender. One-sixth of the studies did not even report gender composition. Of course, given the already-noted gender skew of many samples, it may be that the number of females in many of these studies was too small to permit meaningful analyses by gender. Nevertheless, the absence of gender comparisons leaves one uncertain whether results apply equally well to the smaller number of female subjects of most studies. Alternatively, negative results may be obtained even when relationships do exist between experimental vari-
ables and schizophrenic individuals of one gender because those relationships are obscured by the blending of samples without consideration of separate gender effects.

Something clearly needs to be done. As Goldstein and Tsuang (1990) point out, there appears to be renewed interest in gender differences in schizophrenia, and this interest is reflected in a growing number of studies focused on such gender differences. However, the attention to possible gender effects within schizophrenia research not specifically seeking such differences continues to be lacking, as does adequate inclusion of females in such research. Schizophrenia researchers, then, must attend more carefully to the gender composition of their samples and seek to include more females. They must also routinely analyze their results for potential gender effects. Journal editors and reviewers also have a role, since it is they who have accepted articles without gender analysis or, in some cases, even without specification of the gender composition of research samples. In addition, research is needed that might shed light on the mechanisms through which schizophrenia research has become so male oriented, research that explores how research studies end up with many more male than female subjects in their samples.

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