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## PERSONALITY TRAITS OF WOMEN WITH BREAST CANCER: BEFORE AND AFTER DIAGNOSIS<sup>1, 2</sup>

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*Summary.*—The aim of this study was to investigate the extent to which the diagnosis of breast cancer influences the self-assessment of personality traits by patients. In 1989 and 1990, all female inhabitants of Nijmegen aged 43 years and over were invited to participate in a population screening for breast cancer and were asked to complete a personality questionnaire. During 1989–1992, 25 women who were diagnosed as having breast cancer were psychologically assessed for a second time 1 1/2 years after diagnosis. A control group of 822 healthy women also completed the questionnaire twice. A statistically significant decrease in scores on three scales (Rationality, Emotional Expression-out, and Emotional-Control) was reported by the patient group compared to the control group.

Psychosocial problems may arise when women are confronted with the diagnosis of breast cancer. Self-reports on scales measuring personality traits such as anxiety, anger, depression, and optimism from women diagnosed with breast cancer after diagnosis are expected to be influenced by the distress this life-threatening disease induces. In a number of studies, an increase on measures of anxiety and depression has been reported after diagnosis and treatment for breast cancer (Morris, Greer, & White, 1977; Maguire, Lee, Bevington, Küchemann, Crabtree, & Cornell, 1978; Freidenbergs, Gordon, Hibbard, Levine, Wolf, & Diller, 1982; Dean, 1987; Van Heeringen, Van Moffaert, & De Cuypere, 1989).

In the debate on personality type as a risk factor for cancer, the question of whether personality profiles differ before and after diagnosis of cancer is crucial. Few studies have described results of psychological assessments of breast cancer patients before and after surgery (Grassi & Molinari, 1988; Jelicic, Bonke, & Millar, 1993). However, information about personality traits before knowledge of the diagnosis of breast cancer compared with personality traits measured after diagnosis and treatment is rare. Sometimes,

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personality traits assessed after diagnosis of cancer are generalized in such a way that these variables were also expected to be part of the personality before diagnosis. For example, a "repressive coping style" and "a tendency to control anger" have been reported to characterize cancer patients compared with noncancer controls (Watson, Pettingale, & Greer, 1984).

In other studies, psychological variables were measured in patients with a suspicious abnormality in the breast prior to a definite diagnosis of cancer. Greer and Morris (1975) reported a statistically significant association between the diagnosis of breast cancer and a pattern of behavior characterized by an abnormal release of emotions persisting throughout adult life. This abnormality was, in most cases, extreme suppression of feelings. Extreme expression of emotions, although much less common, also occurred in a higher proportion of cancer patients than controls. In a study by Jansen and Muenz (1984), women with breast cancer recorded reduced scores on aggression and exhibitionism, along with increased depression scores prior to being aware of the diagnosis.

The aim of the present study is to investigate the extent to which diagnosis of breast cancer influences self-reports on measures of psychological personality traits.

## METHOD

### *Procedure*

In the Dutch city of Nijmegen, a project which screens the population for breast cancer with biennial mammogram has been carried out since 1975. During 1989 and 1990 (eighth screening round), women, by that time age 43 years and over, were invited to participate in this screening project on a voluntary basis. Together with the invitation, these women received the Self-assessment Questionnaire–Nijmegen (SAQ–N) by mail. The women invited for the screening project were asked to complete this psychological personality questionnaire and to return it before participation in the screening for breast cancer. In 1991 and 1992 (ninth screening round) all women still living in Nijmegen (the same group as in the eighth screening round, age 45 years and over) were invited for the next breast cancer screening round. Those women with breast cancer detected by the screenings of 1989–1992 who were treated by surgery and radiotherapy ( $n=32$ ) were approached for participation in the follow-up study by completing a battery of questionnaires, including the Self-assessment Questionnaire–Nijmegen. On the average 19.5 mo. ( $SD=7.6$ ) after the detection of breast cancer the questionnaire was completed for a second time.

### *Subjects*

Of approximately 31,000 women invited to participate in the period

from January 1989 up to December 1990, approximately 17,000 attended the screening program for breast cancer. A similar participation rate was noted in 1991–1992. Of those women who received the questionnaire in 1989–1990, a group of 9,705 (age,  $M=56.6$  yr.,  $SD=9.7$ ) completed the questionnaire. Breast cancer was detected in 65 women who had answered the questionnaire. Given the privacy rules of the hospital we were able to ask only those women ( $n=32$ ) who received radiotherapy for further participation (49% of the respondents diagnosed with breast cancer). Of these 32 patients treated with radiotherapy two were deceased at the time of follow-up. In total, 30 patients who answered the questionnaire before the screening were asked to participate in the follow-up study. Of these, five women refused to participate in the follow-up. Of the 25 women who were willing to complete our questionnaire for a second time, in 11 women breast cancer had been detected in the eighth screening round and in 14 women in the ninth screening round. Patients diagnosed during the eighth screening round (1989–1990) had completed the questionnaire two weeks before diagnosis, whereas women in whom breast cancer was detected during the ninth screening round (1991–1992) had completed the SAQ–N about two years earlier (since the questionnaire was distributed in the eighth round only). However, all 25 women had a mammogram within 14 days after the completion of the questionnaire since all 25 women attended the eighth screening round. Mean age of the sample ( $n=25$ ) was 62.5 yr. ( $SD=10.3$ ) at the time of the detection of breast cancer.

Due to the logistics of the screening program, the relatively younger women in the invited population (age group 43–49 years) were asked to participate in the screening for a second time during 1989–1990. Of the 9,705 women in the sample, 822 completed the questionnaire twice, with an average interval of 19.5 mo. ( $SD=1.6$ ). The mean age of this control group was 46.0 yr. ( $SD=3.3$ ).

### *Instruments*

The Self-assessment Questionnaire–Nijmegen was used to assess “how someone feels or behaves in general” (Van der Ploeg, 1989). It is a personality questionnaire that is composed of the following scales: Anxiety (Van der Ploeg, Defares, & Spielberger, 1980; Spielberger, 1983), Anger (Spielberger, Jacobs, Russell, & Crane, 1983; Van der Ploeg, Defares, & Spielberger, 1982; Spielberger, 1988), Depression (Zung, 1973; Mook, Kleijn, & Van der Ploeg, 1989), Rationality, Anti-emotionality, Understanding (based on Grosarth-Maticcek, Bastiaans, & Kanazir, 1985; Van der Ploeg, Kleijn, Mook, Van Donge, Pieterse, & Leer, 1989; Bleiker, Van Der Ploeg, Hendriks, Leer, & Kleijn, 1993), Optimism (Scheier & Carver, 1985; Mook, Kleijn, & Van der Ploeg, 1992), Social Support (Sarason, Levine, Basham, & Sarason,

1983), and Emotional Expression-in, Emotional Expression-out, and Emotional Control (based on Watson & Greer, 1983; Spielberger, 1988; Bleiker, *et al.*, 1993). Furthermore, the Depression scale has two subscales, one with 10 items related to somatic depression, e.g., "I get tired for no reason," and one with 10 items related to psychological depression, e.g., "I am more irritable than usual." Most scales in the questionnaire are Dutch adaptations of questionnaires with well-known reliability and validity. The general question is "How do you *usually* feel or behave?". The questionnaire has 98 items to which subjects responded on a frequency scale, ranging from 1 (almost never) to 4 (almost always). A low mean rating on each scale indicates a low perceived frequency of the self-reported affect.

The reliability coefficients of the scales of the questionnaire are indicated with Cronbach alpha and are shown in Table 1 below. This coefficient of reliability is computed over the total population of women who completed the questionnaire ( $N=9,705$ ).

### *Statistics*

Analysis of variance was performed using a two-factor design, including (1) the patient vs control group and (2) psychological scores before vs after screening/diagnosis. To investigate whether a change in the mean scores of the patient group was significantly different from those of the control group, the interaction effect was computed. Instead of contrasting a large number of controls for a relatively small patient group ( $n=25$ ), we randomly divided the control group into 33 subgroups of equal size of 25 women and contrasted the patient group with the pooled control groups. Since cell sizes were equal, the analysis of variance design was balanced, and therefore all contrasts were orthogonal. To test differences between the patient and the control groups we used the first Helmert contrast with the patients as the first group (Norušis, 1990).

### RESULTS

To answer the question to what extent the diagnosis of breast cancer and its consequences may have influenced the self-report of personality traits, the interaction of patients vs controls with the assessment before and after screening was analyzed (see Table 1). When comparing the increase or decrease of the scores on each scale separately for the patient group with those of the control groups ( $N=822$ ; which makes 33 groups of usually 25 subjects), three statistically significant interactions were found; the mean scores of the patient group showed a statistically significant decrease compared to the control group, specifically, for Rationality ( $F=6.22$ ,  $p<.01$ ), Emotional Expression-out ( $F=3.81$ ,  $p<.05$ ), and Emotional Control ( $F=4.97$ ,  $p<.05$ ).



TABLE 1

MEANS AND STANDARD DEVIATIONS FOR 'PATIENT' ( $n = 25$ ) AND CONTROL GROUPS ( $n = 822$ ) BEFORE AND AFTER SCREENING, AND  $F$  RATIOS WITH  $p$  VALUES OF PATIENT GROUP WITH THE POOLED DIFFERENCES IN MEAN OF THE 33 CONTROL GROUPS ( $n = 33 \times 25$ )

| Scale                    | $\alpha$ | Group   | Mean SAQ-N Scores |      |                 |      | Pooled Interaction |     |
|--------------------------|----------|---------|-------------------|------|-----------------|------|--------------------|-----|
|                          |          |         | Before Diagnosis  |      | After Diagnosis |      | $F$                | $p$ |
|                          |          |         | $M$               | $SD$ | $M$             | $SD$ |                    |     |
| Anxiety                  | .92      | Patient | 35.2              | 10.9 | 36.5            | 11.4 | .85                | .36 |
|                          |          | Control | 38.7              | 10.8 | 38.7            | 10.8 |                    |     |
| Anger                    | .85      | Patient | 16.2              | 4.0  | 15.7            | 4.5  | .13                | .72 |
|                          |          | Control | 18.0              | 5.1  | 17.6            | 4.9  |                    |     |
| Depression               | .81      | Patient | 35.3              | 7.8  | 37.1            | 7.8  | 2.64               | .11 |
|                          |          | Control | 36.1              | 8.0  | 36.2            | 8.0  |                    |     |
| Depression-somatic       | .59      | Patient | 18.6              | 3.8  | 19.0            | 3.7  | .46                | .50 |
|                          |          | Control | 18.3              | 3.9  | 18.3            | 4.0  |                    |     |
| Depression-psychological | .80      | Patient | 16.8              | 5.0  | 18.1            | 4.8  | 3.56               | .06 |
|                          |          | Control | 17.8              | 4.8  | 17.8            | 4.8  |                    |     |
| Rationality              | .76      | Patient | 17.2              | 4.4  | 15.5            | 3.0  | 6.22               | .01 |
|                          |          | Control | 14.5              | 3.7  | 14.4            | 3.7  |                    |     |
| Anti-emotionality        | .68      | Patient | 8.8               | 2.7  | 8.9             | 2.4  | .04                | .83 |
|                          |          | Control | 8.4               | 2.3  | 8.6             | 2.4  |                    |     |
| Understanding            | .67      | Patient | 8.9               | 2.1  | 8.4             | 1.3  | 1.97               | .16 |
|                          |          | Control | 8.2               | 1.9  | 8.2             | 1.9  |                    |     |
| Optimism                 | .84      | Patient | 24.4              | 5.1  | 23.6            | 4.5  | 1.78               | .18 |
|                          |          | Control | 23.6              | 4.7  | 23.6            | 4.7  |                    |     |
| Social Support           | .82      | Patient | 19.4              | 3.2  | 19.7            | 2.6  | .44                | .51 |
|                          |          | Control | 18.3              | 3.7  | 18.2            | 3.8  |                    |     |
| Emotional Expression-in  | .79      | Patient | 11.9              | 3.1  | 12.5            | 3.7  | 1.95               | .16 |
|                          |          | Control | 13.4              | 4.0  | 13.1            | 3.8  |                    |     |
| Emotional Expression-out | .86      | Patient | 14.0              | 4.7  | 12.5            | 3.6  | 3.81               | .05 |
|                          |          | Control | 14.1              | 4.4  | 14.0            | 4.3  |                    |     |
| Emotional Control        | .86      | Patient | 17.8              | 4.7  | 16.2            | 4.0  | 4.97               | .03 |
|                          |          | Control | 16.4              | 4.0  | 16.3            | 3.8  |                    |     |

## DISCUSSION

The aim of the study was to investigate to what extent the diagnosis of breast cancer influenced self-reports on measures of psychological personality traits. Significant interactions were found for scores on the Rationality scale, the Emotional Expression-out scale, and the Emotional Control scale; a significantly larger decrease in scores on measures of these affects was reported by the patient group than by the control group.

In this study, no changes in scores on Anxiety and Depression scales were observed. Statistically significant differences in scores before vs after diagnosis, as compared to a control group, were also not found for Anger, Anti-emotionality, Understanding, Optimism, Social Support, and Emotional Expression-in. Two factors may explain the absence of an effect. First, the follow-up took place at a relatively long period of 1 1/2 years after diagno-

sis. By that time the anxiety and depression, which might have increased during the first months, may have returned to their initial levels. It is possible that patients adapted to the new situation or changed their internal standards for assessing their affects (Sprangers, Rozemuller, Van den Berk, Boven, & Van Dam, 1994). Second, the personality scores may be considered reliable reflections of stable traits. This is not surprising if we consider that "personality" refers to "characteristics of persons that persist across time and situation, or of characteristics that are definitive of the wholeness and distinctiveness of an individual" (Ouellette Kobasa, 1990, p. 15).

Some psychological personality traits such as a "repressive coping style" and "a tendency to control anger" (e.g., Watson, *et al.*, 1984) are reported to be more common in breast cancer patients than in controls without cancer. Those results were frequently based on psychological assessments obtained after diagnosis or just before diagnosis when persons were aware of the existence of a suspicious lesion. The important question here is whether these so-called "cancer-prone personality traits" represent stable characteristics of cancer patients or an emotional reaction to the expected diagnosis. Except for Rationality, Emotional Expression-out, and Emotional Control, the mean scores on the scales of the questionnaire 1 1/2 years after diagnosis do not differ from the mean scores on these scales before knowledge about a possible diagnosis of breast cancer. In this study, mean scores on the three scales mentioned above seem to be sensitive to the diagnosis of breast cancer and its consequences, e.g., surgery and radiotherapy. The other personality measures assessed about 1 1/2 years after diagnosis seem to be a reliable reflection of stable traits. The finding that no significant changes in the scores of patients on most scales were observed disconfirms the notion that diagnosis and treatment produce long-term differences on these scales. This result may be of importance in the interpretation of results from retrospective studies in which self-reports of personality traits are measured about 1 1/2 years after diagnosis of breast cancer.

One subject of importance for further investigation is the time at which a questionnaire about self-reported personality traits should be administered. All 25 women completed the questionnaire before having a mammogram in the eighth screening round. Therefore, the influence of the stressful situation induced by the screening and the possibility of a breast cancer diagnosis on the self-reports of affect may have been comparable in these women. Eleven women received the diagnosis of breast cancer about two weeks later, while 14 women received this diagnosis in the next screening round, two years later. When comparing the mean scores and standard deviations on the several scales for these two groups, measured before the eighth screening, no statistically significant differences were found. For the total group ( $n=25$ ) the completion of the second questionnaire was after an average interval of 1

1/2 years after diagnosis. The time of the follow-up administration is an important topic for further investigation since scores on personality scales like Anxiety and Depression may be related to the period of time passed since the diagnosis of breast cancer.

A final subject of discussion is the difference between the mean scores of the 'patient' and the control groups before the screening. Since both groups were not aware of any diagnosis, we expected similar mean scores on each scale for both groups. Since the aim of the study was to investigate differences in change of mean scores between the two groups, we did not focus on this subject. However, we observed a significantly higher mean score on the Rationality scale for the 'patients' before the screening. This difference was smaller at the follow-up measurement. This finding would tentatively support the 'cancer-prone theory' (e.g., Eysenck, 1994). However, some care must be taken to interpret this difference as proof of the cancer-prone personality, since of the 13 comparisons at least one significant difference could be expected by chance.

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