

# Assessment of 'Cancer-prone Personality' Characteristics in Healthy Study Subjects and in Patients with Breast Disease and Breast Cancer Using the Commitment Questionnaire: A Prospective Case–Control Study in Finland

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**Abstract.** *Background:* The findings of a repressed expression of emotions in cancer patients contributed to the hypothesis developed by Lydia Temoshok of a type C personality ('cancer-prone'). To the Authors' knowledge, the associations between the 'cancer-prone personality' characteristics in commitment test and the risk of breast cancer (BC) have rarely been considered together in a prospective study. *Patients and Methods:* In an extension of the Kuopio Breast Cancer Study, 115 women with breast symptoms were evaluated for commitment test before any diagnostic procedures were carried out. *Results:* The clinical examination and biopsy showed BC in 34 patients, benign breast disease (BBD) in 53 patients and 28 individuals were shown to be healthy study subjects (HSS). The BC group reported significantly more commitment to own children (Function A) (mean Commitment score, 3.14) than the patients in the BBD group (mean Commitment score, 3.51) and in the HSS group (mean Commitment score, 3.77) ( $p=0.05$ ). The women in the BC group also reported more commitment to own husband (Function B) (mean Commitment score, 3.30) than the patients in the BBD group (mean Commitment score, 3.83) and the patients in the HSS group (mean Commitment score, 3.76). The BC group reported significantly more commitment to own work and own body (Function D and G) (mean Commitment scores, 3.20 and 3.50) than the patients in the BBD group (mean Commitment scores, 3.75 and 3.71) or HSS group (mean Commitment scores, 3.46 and 3.50). The mean sum (mean, SD) of the scores were significantly

lower in the BC group (31.1, 5.8) than in the BBD (35.2, 6.9) and HSS group (36.4, 5.6) ( $p=0.02$ ), showing more commitment in the BC group. *Conclusion:* In summary, patients with BC tended to have an increased risk for bearing the 'high commitment' characteristic and this pattern could contribute to cancer risk through immune and hormonal pathways.

According to Temoshok's theoretical model (1, 2), the main personality factors increasing breast cancer (BC) risk are suppression of emotions and coping style characterized by a tendency to defer one's own needs to the needs of others (commitment). The early findings of a repressed expression of emotions in cancer patients contributed to the hypothesis developed by Lydia Temoshok of a type C personality bearing these findings (1, 2). Because BC is a hormonally responsive neoplasm and one with great psychological impact, it has been the most extensively investigated tumour for possible psychological variables associated with risk and survival (3). Hormonal factors, such as early age at menarche, later age at menopause, later age at first full-term pregnancy and hormone replacement therapy, are known to be the main risk factors for sporadic BC (4). In addition, life-style factors, such as obesity, smoking, alcohol consumption and lack of physical activity, appear to contribute to an increased risk for this malignancy, although the results concerning such factors are inconsistent (4-10). Psychological factors, such as stressful and adverse life events, are widely thought to play a role in the aetiology of BC (11-30). To the Authors' knowledge, the associations between 'cancer-prone' personality characteristics in a commitment test and the risk of breast cancer are rarely considered together, and therefore this was a prospective study to examine the role of the 'cancer-prone' personality characteristics in a commitment test in women with breast symptoms referred by physicians to the Kuopio University Hospital (Finland).

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Table I. Characteristics of the study participants. Results are shown for the patients with breast cancer (BC), for those with benign breast disease (BBD) and for the healthy study participants (HSS).

Variable	HSS (n=28)	BBD (n=53)	BC (n=34)	p-Value
Age (mean, years)	45.7	47.6	51.6	0.12
Height (mean, cm)	160.8	162.3	164.4	0.75
Body weight (mean, kg)	68.3	67.8	72.5	0.25
Age at menarche (mean, years)	13.4	13.4	13.4	0.99
Age at birth of I child (mean, years)	25.0	25.0	25.2	0.92
Age at menopause (mean, years)	50.0	48.9	47.9	0.53
No. of children (mean)	2.5	2.4	2.6	0.27
Parity	23 (82%)	44 (83%)	31 (91%)	0.50
Breast feeding (mean, months)	3.9	3.4	3.6	0.77
Use of oral contraceptives	18 (64%)	25 (47%)	13 (38%)	0.12
HRT	14 (50%)	36 (68%)	27 (79%)	0.44
Premenopausal	18 (64%)	28 (53%)	13 (38%)	0.10
Postmenopausal	10 (36%)	25 (47%)	21 (62%)	0.12
History of previous BBD	10 (36%)	22 (42%)	18 (53%)	0.37
Family history of BC	5 (18%)	5 (9%)	1 (3%)	0.21
Use of alcohol	13 (46%)	31 (58%)	21 (62%)	0.44
Smoking	10 (36%)	21 (40%)	15 (44%)	0.80

HRT, Use of hormonal replacement therapy.

## Patients and Methods

The Kuopio Breast Cancer Study was a multidisciplinary cooperative project conducted by different departments of the University of Kuopio and Kuopio University Hospital, and included all women who were referred to the hospital for breast examination between April 1990 and December 1995. The Kuopio Breast Cancer Study followed the protocol of the International Collaborative Study of Breast and Colorectal Cancer coordinated by the European Institute of Oncology in Milan, and was initiated as a SEARCH program of the International Agency for Research on Cancer. The collaborative study is based on the assumption that breast cancer and colorectal cancer may have common risk factors. Study centers for the breast cancer study are situated in Canada, Finland, Greece, Ireland, Italy, Russia, Slovakia, Spain and Switzerland (31). The study participants showed breast cancer symptoms (a lump in the breast or in the axilla, pain in the breast, bleeding from the nipple, nipple discharge and/or skin dimpling), or an abnormality of the breast, and the indications for referral in this study were in line with our previous investigations in a Breast Cancer Diagnostic Unit in Finland (32).

This case-control study was an extension of the Kuopio Breast Cancer Study (33, 34) and was approved by the Joint Committee of the University of Kuopio and Kuopio University Hospital. The women referred from January 1991 to June 1992 were included. Participation was based on written consent. One hundred and fifteen women participated and were interviewed (to determine the level of emotional depression) by a psychiatrist (P.O.) before any diagnostic procedures, so neither the interviewer nor the patient knew the diagnosis at the time of the interview. The interviews were recorded and the ratings were completed before the final diagnosis. The clinical examination, mammography and biopsy showed BC in 34 (29.6%) patients, benign breast disease (BBD) in 53 (46.1%) patients and 28 (23.4) patients with healthy study subjects (HSS) (Table I).

*Commitment questionnaire (CQ).* The women completed the Commitment questionnaire with nine key questions which attempt to elucidate the commitment characteristics. The commitment characteristics were assessed for the HSS, BBD and BC groups on a five-point scale: grade I (1 point) indicating high commitment characteristics, and grade V (5 points) low commitment characteristics.

*Statistical analysis.* Significance of the results was calculated with the SPSS/PC statistical package (SPSS Inc., Chicago, IL, USA). Correlations and differences between the study groups (BC, BBD and HSS groups) were measured with the two-sided Chi-square test and non-parametric Kruskal-Wallis variance analyses. Results were considered statistically significant at a *p*-value <0.05.

## Results

The mean age of the BC patients was 51.5 years. The corresponding figure for the patients with BBD was 47.5 years and for the HSS group 45.7 years. Although the patients in the BC group were older than those in the BBD and HSS groups, the age difference was not statistically significant (*p*=0.12). The majority of the patients (85/115, 74%) were married or living in a steady relationship. Almost half of the patients (41.7%) had graduated from primary school, and 25% had a college education. By profession, the patients represented industrial and service employees (25.2%), office employees (10.4%), health care employees (8.7%) and farmers (8.7%) and almost 23.5% were retired. The combined mean gross income of both spouses in the patients with BC was 36,100 € per year. The corresponding figures for the patients with BBD were 27,714 € per year and for the healthy study subjects (HSS) were 24,521 € per year. The patients with BC were

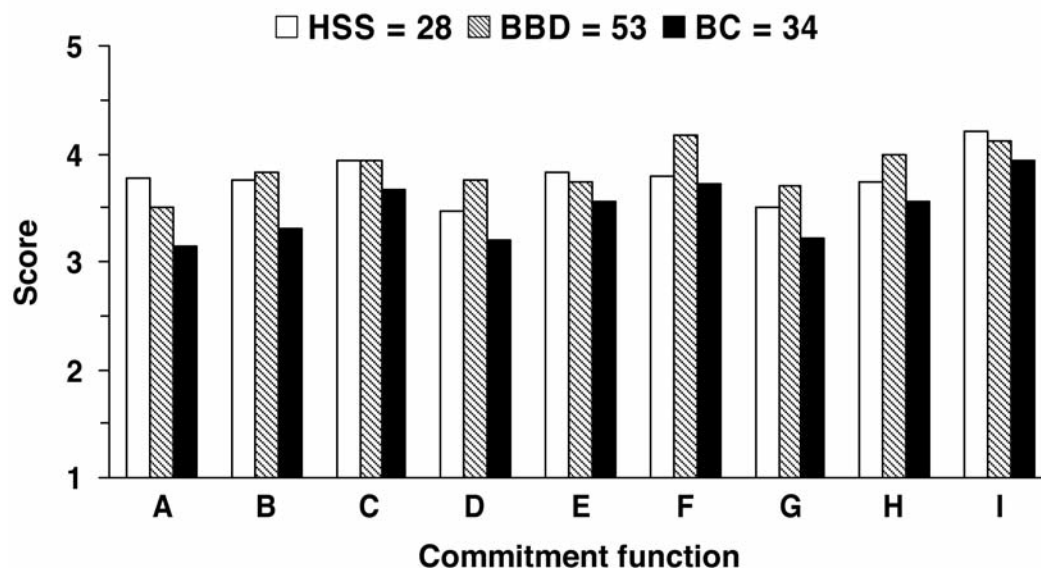


Figure 1. The distribution of the mean sum of the Commitment Scores in nine separate categories, for the healthy study participants (HSS), for those with benign breast disease (BBD) and for patients with breast cancer (BC). A, Commitment to own children,  $p=0.05$ ; B, Commitment to own husband,  $p=0.05$ ; C, Commitment to own parents,  $p=0.52$ ; D, Commitment to work,  $p=0.06$ ; E, Commitment to free time,  $p=0.50$ ; F, Commitment to sexuality,  $p=0.22$ ; G, Commitment to own body,  $p=0.05$ ; H, Commitment to own breast,  $p=0.19$ ; I, Commitment to normativity,  $p=0.36$ .

significantly ( $p=0.03$ ) wealthier than the patients with BBD and HSS, as estimated by the combined gross income of both spouses. The groups differed only slightly from each other as to the factors of the reproductive life of the women (Table I).

*The distribution of the Commitment Score.* The distribution of the mean sum of the Commitment Scores in nine separate categories, for HSS, BBD and BC groups are shown in Figure 1. The BC group reported significantly more commitment to own children (Function A) (mean Commitment Score, 3.14) than the patients in the BBD group (mean Commitment Score, 3.51) and in the HSS group (mean Commitment Score, 3.77) ( $p=0.05$ ). The women in the BC group also reported more commitment to own husband (Function B) (mean Commitment Score, 3.30) than the patients in the BBD group (mean Commitment Score, 3.83) and the patients in the HSS group (mean Commitment Score, 3.76). The BC group reported significantly more commitment to own work and own body (Function D and G) (mean Commitment Scores, 3.20 and 3.50) than the patients in the BBD group (mean Commitment Scores, 3.75 and 3.71) or HSS group (mean Commitment Scores, 3.46 and 3.50). The mean sum (mean, SD) of the scores of the Commitment test variables were significantly lower in the BC group (31.1, 5.8) than in the BBD (35.2, 6.9) and HSS group (36.4, 5.6) ( $p=0.02$ ).

## Discussion

Lydia Temoshok noted the absence of theoretical constructs in psychosocial research and proposed the type C personality, using concepts from the personality types A and B originally constructed for research on the relationship between life stress and cardiovascular disease (35). Temoshok's type C personality maintains emotional control and pleasant interpersonal relations despite internal unexposed distress (1, 2). The type C person ('cancer-prone' person) copes with stressful life changes and loss by depressive symptoms, suppression of emotions and coping style characterized by a tendency to defer one's own needs to the needs of others (commitment). Personality as risk factor for developing cancer *via* a 'cancer-prone personality' remains debatable, but this pattern could contribute to cancer risk through immune and hormonal pathways. The focus of this study was to investigate the coping style characterized by a tendency to defer one's own needs to the needs of others in HSS, in BBD and BC patients.

It has been shown that caring for disabled older adults causes adverse effects on caregivers' health, such as anxiety and depression. Subjective burden mediates this relationship and therefore resolving subjective burden leads to prevention of the negative effects of caring for disabled older adults (36). Theoretical models that try to explain the stress in care-giving are often based on the stress model by Folkman

and Lazarus (37). Stress related to care giving outcomes is determined by factors such as social support and coping. Subjective burden is associated with several factors such as approach coping skills, avoidance coping, emotion-focused coping, problem-focused coping, and control of negative thoughts (36). Avoidance coping is positively associated with subjective burden in home caregivers of older relatives with cognitive impairment. Emotion-focused coping could be a mix of coping categories and approach coping and problem-focused coping depend on stressor type (36).

From the popular belief that psychological factors have a significant role in the carcinogenesis of the breast, it follows that study subjects with breast cancer may be more prone than healthy subjects to report prior stress and other psychological problems in an effort to explain their BC. This could lead either to a false-positive association between psychological factors and BC risk or to the overestimation of true positive associations. Therefore, the study was designed to reduce the recall bias; the reports on psychological factors were obtained from the study subjects who had BC symptoms, but had not yet been given a definitive diagnosis.

The subjects in the BC group were significantly more committed to their own children, husband and own body than the subjects in the BBD and HSS groups. The mean sum of the scores of the Commitment test variables were significantly lower in the BC group than in the BBD and HSS groups, showing more commitment in BC group. To our knowledge, there are no previous reports with this study design available for sufficient comparative evaluation and to examine the role of the Commitment test in HSS, BBD and BC groups. Scherg (38) studied 75 women with BC prospectively comparing them to 75 benign controls, matched in pairs for age and reason for consultation, and found that the BC patients put off their own wishes in favour of a more social behaviour in the Social Desirability scale. Scherg also noted that the awareness of BC can mask an association between psychosocial scales and BC risk and proposed that an appropriate control group is crucial in order to avoid bias.

One potential bias arises from age being a confounding factor, and some of the earlier studies have been criticized on such methodological grounds as limited controlling for age (39). In the present study, the BC group was 4.0 years and 5.9 years older than the BBD group and the HSS group, respectively. However, no statistically significant age difference between these groups was found in our study ( $p=0.12$ ).

In summary, the results of this study do not support a specific link between 'cancer-prone personality' characteristics in general and breast cancer risk. Although, the patients with BC tended to have a risk for 'high commitment' characteristics, the personality as risk factor for developing cancer *via* a 'cancer-prone personality' remains

debatable, and this pattern could contribute to cancer risk through immune and hormonal pathways.

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