

The Relation of Hopelessness/Helplessness *versus* Beck Depression Inventory (BDI) in Healthy Individuals and in Patients with Benign Breast Disease and Breast Cancer: A Prospective Case-control Study in Finland

MATTI ESKELINEN^{1,2}, RIIKA KORHONEN¹, TUOMAS SELANDER³ and PAULA OLLONEN⁴

¹Surgery and ⁴Psychiatry, School of Medicine, University of Eastern Finland, Kuopio Campus, Kuopio, Finland;

²Department of Surgery and ³Science Service Center, Kuopio University Hospital, Kuopio, Finland

Abstract. *Background/Aim:* The relation between hopelessness/helplessness versus the Beck Depression Inventory (BDI) in healthy study subjects (HSS) and in patients with benign breast disease (BBD) and breast cancer (BC) has not been compared in a prospective study before. We, therefore, investigated hopelessness and helplessness versus the BDI in 115 patients. *Patients and Methods:* In the Kuopio Breast Cancer Study, 115 women with breast symptoms were evaluated for hopelessness and helplessness versus the BDI before any diagnostic procedures were carried out. *Results:* In the self-rating score (SRS), the hopelessness and the helplessness versus the BDI were highly significantly positively correlated in the HSS, BBD and BC groups. In the SRS, the weighted kappa values for hopelessness and helplessness versus the BDI in the HSS, BBD and BC groups were also statistically significant. There was also a significant positive correlation in the examiner-rating score (ERS) in the hopelessness versus the BDI in the BBD and BC groups and in the ERS in helplessness versus the BDI in the HSS and BBD groups. The unweighted kappa values in the ERS for hopelessness versus the BDI in the HSS and BBD groups were statistically highly significant and the unweighted kappa values in the ERS for helplessness versus the BDI in the BBD and BC groups were statistically significant. *Conclusion:* The results of this study support a powerful link between hopelessness and

helplessness versus BDI in the self-rating and examiner-rating. This finding is of clinical importance since, in the breast cancer diagnostic unit, the patients with hopelessness/helplessness characteristics and high BDI score might be associated with a difficulty and delay in reaching BC diagnosis.

Lack of hope is associated with various manifestations of psychological morbidity (1) and is an important determinant of subjective well-being (2). A two-year follow-up study of Haatainen *et al.* (3) in Finland showed 11.4% prevalence of hopelessness and, after excluding self-reported mental disorders, the prevalence of hopelessness was still 7.8% in the general population (3). We assessed hopelessness *versus* helplessness in patients with breast cancer (BC), benign breast disease (BBD) and healthy study subjects (HSS) (4, 5). Our results suggested a specific link between hopelessness and helplessness attitude characteristics in breast disease. However, the results of hopelessness/helplessness *versus* Beck Depression Inventory (BDI) in the healthy study patients (HSS) and in patients with benign breast disease (BBD) and breast cancer (BC) have not been compared in a prospective study. Depression is one of the most common psychological disorders and cross-sectional studies have found an association between depression, hopelessness and hastened death in terminally ill patients with cancer (6). Hopelessness may also occur as a precursor of depression (7) or independent of depression in physical illness (8). Because BC is a hormonally-responsive neoplasm with great psychological impact, it is the tumor type most extensively investigated for possible psychological variables associated with risk and survival (9). 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 (10, 11). In addition, life-style factors, such as obesity, smoking, alcohol consumption and lack of physical activity, appear to

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Correspondence to: Matti Eskelinen, MD, Ph.D, School of Medicine, University of Eastern Finland, P.O. Box 100, FI-70029 KYS, Finland. Tel: +358 17173311, Fax: +358 17172611, GSM: +358 400969444, e-mail: matti.eskelinen@kuh.fi

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

contribute to an increased risk for this malignancy, although the results concerning such factors are inconsistent (12-17).

Psychological factors, such as stressful and adverse life events, are widely thought to play a role in the aetiology of BC (18-39). To our knowledge, the associations between hopelessness/helplessness *versus* BDI are rarely considered together. Therefore, we carried out this prospective study to examine the role of hopelessness/helplessness *versus* BDI in women with breast symptoms referred by physicians to the Kuopio University Hospital.

Patients and Methods

The Kuopio BC 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 BC Study followed the protocol of the International Collaborative Study of Breast and Colorectal

Table II. The Spearman correlation coefficients and kappa values between the self-rating score (SRS) for hopelessness and helplessness *versus* Beck Depression inventory (BDI) and the examiner rating score (ERS) for hopelessness and helplessness *versus* the BDI in the healthy study participants (HSS), benign breast disease (BBD) and breast cancer (BC) groups.

Group	Spearman (p-Value)	Kappa (p-Value)	Weighted kappa (p-Value)
Rating of hopelessness (SRS) <i>vs.</i> BDI			
HSS	0.390 (0.040)	0.006 (0.937)	0.201 (0.045)
BBD	0.594 (<0.001)	0.066 (0.234)	0.291 (<0.001)
BC	0.521 (<0.001)	0.118 (0.098)	0.273 (0.002)
Rating of helplessness (SRS) <i>vs.</i> BDI			
HSS	0.447 (0.017)	0.002 (0.985)	0.220 (0.028)
BBD	0.445 (0.001)	0.090 (0.107)	0.230 (0.001)
BC	0.332 (0.055)	0.183 (0.019)	0.260 (0.008)
Rating of hopelessness (ERS) <i>vs.</i> BDI			
HSS	0.590 (<0.001)	0.160 (0.026)	0.278 (<0.001)
BBD	0.500 (<0.001)	0.029 (0.601)	0.212 (0.002)
BC	0.503 (0.002)	-0.044 (0.554)	0.195 (0.064)
Rating of helplessness (ERS) <i>vs.</i> BDI			
HSS	0.458 (0.014)	-0.094 (0.251)	0.173 (0.088)
BBD	0.355 (0.009)	0.005 (0.937)	0.161 (0.038)
BC	0.303 (0.082)	0.163 (0.035)	0.201 (0.029)

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 BC and colorectal cancer may have common risk factors. Study centres for the BC study are situated in Canada, Finland, Greece, Ireland, Italy, Russia, Slovakia, Spain and Switzerland (40). The study participants showed BC symptoms (a lump in the breast or in the axilla, pain in the breast, bleeding from the nipple, nipple discharge or skin dimpling) or an abnormality of the breast. The indications for referral in this study were in line with our previous investigations in a BC Diagnostic Unit in Finland (41).

This case-control study was an extension of the Kuopio BC Study (42, 43) approved by the Joint Committee of the University of Kuopio and Kuopio University Hospital (approval number 14/12/1989). 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, thus 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, BBD in 53 (46.1%) patients and 28 (23.4%) HSS (Table I).

Beck depression inventory (BDI). Aaron Beck introduced in 1972 an inventory (BDI) for rapid screening of depression even in family practice (44). The women completed the BDI with 21 variables and the BDI was used as a continuous variable in this study.

Scoring of hopelessness. The questionnaire items measuring hopelessness in the self-rating score (Hopelessness SRS) and in the

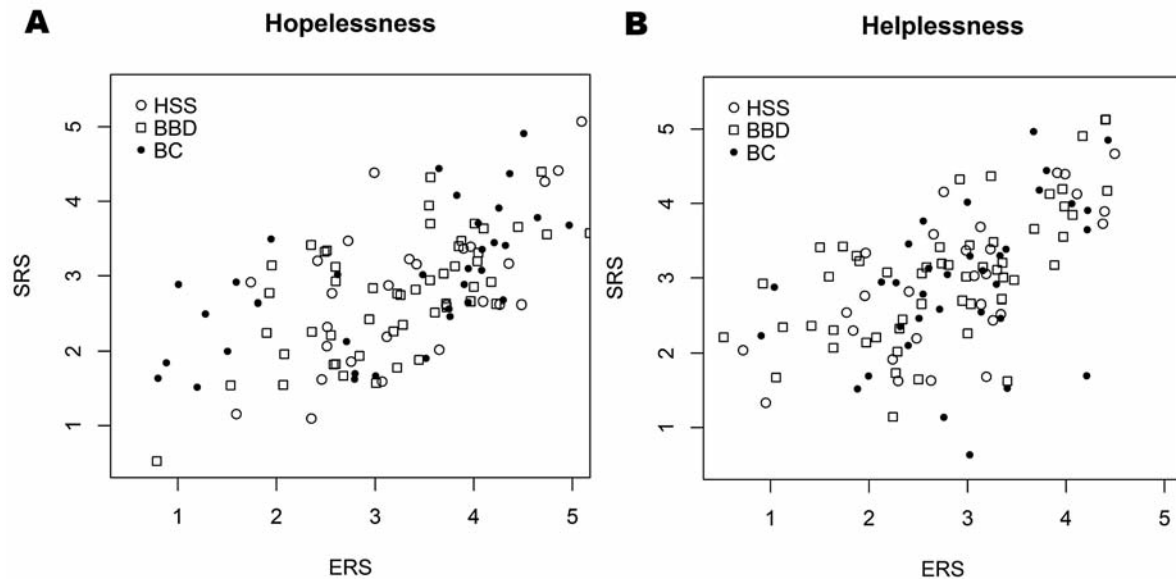


Figure 1. A, B. The jitter plots of the individual values of the self-rating scores (SRS) versus examiner-rating scores (ERS) measuring hopelessness (1A) and helplessness (1B) in five separate categories, for the healthy study participants (HSS), for those with benign breast disease (BBD) and for patients with breast cancer (BC).

examiners-rating score (Hopelessness ERS) were assessed before any diagnostic procedures for the HSS, BBD and BC groups and are shown in our earlier report of hopelessness (4). The mean duration (+SD) of the interview for the patients with BC was 126.5 (21.6) minutes, for the patients with BBD was 127.3 (23.3) minutes and for the HSS group 123.0 (23.3) minutes ($p=0.72$).

Scoring of helplessness. The questionnaire items measuring helplessness (5) in the self-rating score (SRS) were: grade I, 'I feel self-supporting and have no helplessness' (true or false); grade II, 'I feel independent, but have a little helplessness' (true or false); grade III, 'I feel balanced, but have some helplessness' (true or false); grade IV, 'I feel dependent and have clear helplessness' (true or false); and grade V, 'I have strong helplessness' (true or false). The helplessness characteristics in the examiner rating score (ERS) for the HSS, BBD and BC groups were on a 5-point Likert-scale: grade I, no helplessness, self-supporting; grade II, little helplessness, independent; grade III, some helplessness, balanced; grade IV, clear helplessness, dependent; and grade V, strong helplessness.

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 . The agreement between ERS and SRS was assessed using unweighted kappa statistic (Cohens's kappa), where all disagreements were arbitrarily regarded as having equal importance (45, 46), as well as the weighted kappa statistic, where weight matrix cells located on the diagonal (upper-left to bottom-right) represent agreement and, thus, contain zero (47). The kappa statistic provides a measure of agreement after exclusion of the proportion of agreement expected

by chance and can vary from +1, indicating perfect agreement, to 0, indicating agreement no greater than expected by chance. It can also assume negative values up to -1 when agreement is less than expected by chance.

Results

Although the patients in the BC group were older than those in the BBD and HSS groups (51.5 *versus* 47.5 and 45.7 years, respectively), 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. The groups differed only slightly from each other regarding factors of the reproductive life of the women (Table I).

The Spearman correlation coefficients and kappa values for hopelessness/helplessness by the SRS *versus* BDI in the HSS, BBD and BC groups are shown in Table II. In the self-rating score (SRS), the hopelessness and the helplessness *versus* the BDI were highly significantly positively correlated in the HSS, BBD and BC groups. In the SRS the weighted kappa values for hopelessness and the helplessness *versus* the BDI in the HSS, BBD and BC groups were also statistically significant.

The Spearman correlation coefficients and kappa values between hopelessness and helplessness by the ERS *versus* BDI in the HSS, BBD and BC groups are also shown in Table II. There was also a significant positive correlation in the examiner-rating score (ERS) in the hopelessness *versus* the BDI in the BBD and BC groups and in the ERS in helplessness *versus* the BDI in the HSS and BBD groups.

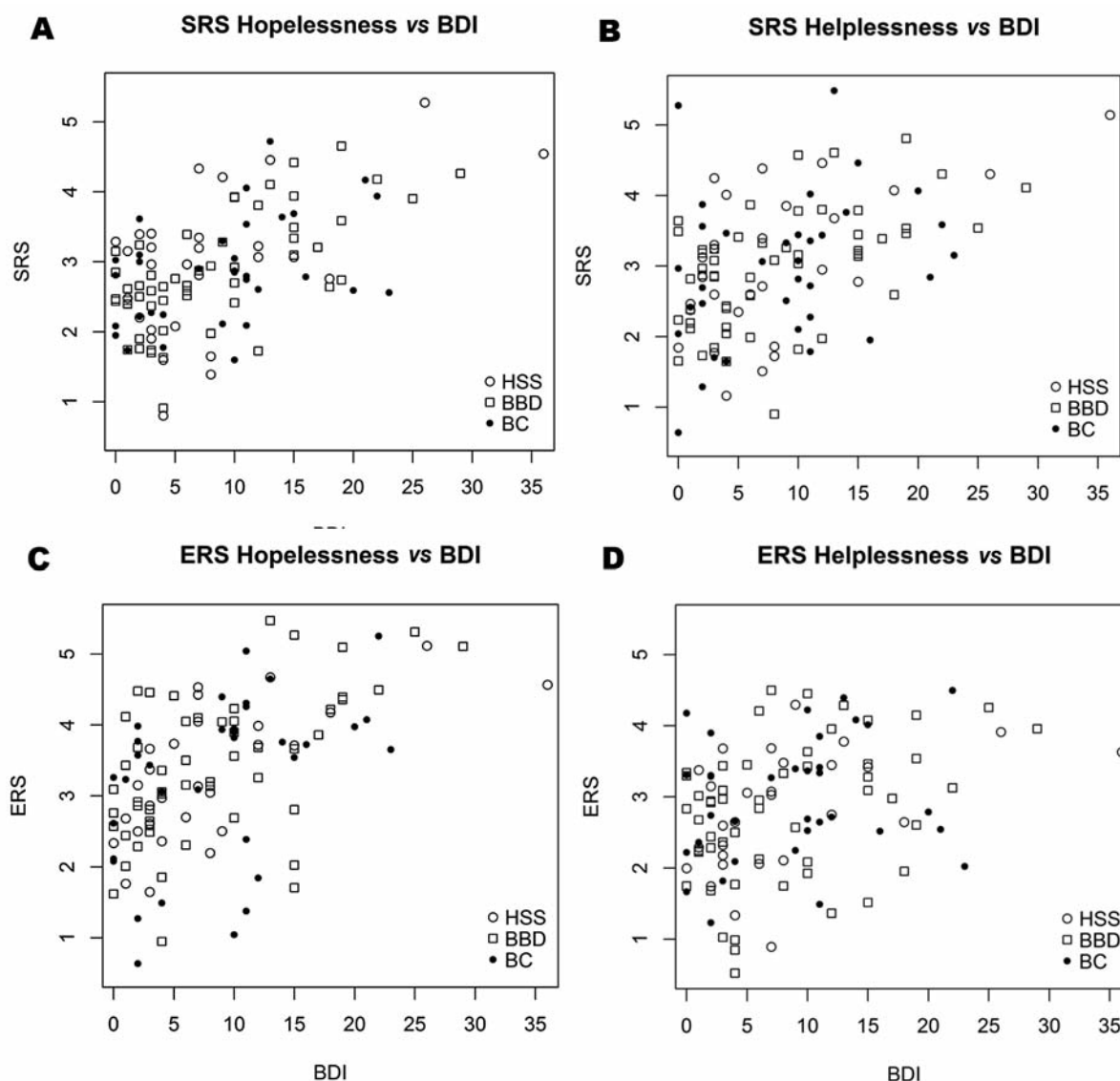


Figure 2A, 2B, 2C and 2D. The jitter plots of the individual values of the self-rating scores (SRS) measuring hopelessness (2A) and helplessness (2B) versus Beck depression inventory (BDI) as a continuous variable and examiner-rating scores (ERS) measuring hopelessness (2C) and helplessness (2D) versus Beck depression inventory (BDI) as a continuous variable, for the healthy study participants (HSS), for those with benign breast disease (BBD) and for patients with breast cancer (BC).

The unweighted kappa values in the ERS for hopelessness versus the BDI in the HSS and BBD groups were statistically highly significant and the unweighted kappa values in the ERS for helplessness versus the BDI in the BBD and BC groups were statistically significant.

Figure 1 shows the jitter plots of the individual values of the SRS versus ERS measuring hopelessness (1A) and helplessness (1B) in five separate categories, for the HSS, BBD and BC groups. Figure 2 shows the jitter plots of the individual values of the SRS measuring hopelessness (2A) and helplessness (2B)

versus BDI as a continuous variable and the ERS measuring hopelessness (2C) and helplessness (2D) versus BDI as a continuous variable, for the HSS, BBD and BC groups.

Discussion

Depression is underdiagnosed in a breast cancer population since depression can have heavy impact on quality of life in a BC patient (48). Many studies have clearly demonstrated that depression and depression-associated symptoms like hopelessness and helplessness affect compliance with cancer

therapy, reduce survival and quality of life (4, 5, 48). Montazeri *et al.* (49) found that the use of alternative medicine is more common among depressed BC patients and suggested that it might be a sign of hopelessness /helplessness in this group of patients. Another point is that these depressed and hopeless patients are not prone to seek earlier BC diagnosis when a breast lump appears or symptoms begin to manifest (50). Hintikka *et al.* (51) in Finland showed 11.7% prevalence of depression in the general population sample, whereas the reliability of the BDI has previously been demonstrated to be 0.89 in a Finnish general population cohort (52). Although there are no previous reports with this study design available for sufficient comparison, some reports of the BDI *versus* hopelessness/helplessness can be obtained. In earlier studies, hopelessness has been found to be associated with depression (53, 54) and in non-clinical cohorts it has been shown to be a predictor of depressive symptoms in the future history (55, 56). It has been suggested that the identification of a hopeless persons is essential in suicide prevention and it is important to assess and treat hopelessness even though a subject reports little depressive symptoms. Despite this, relatively little is known about hopelessness *versus* BDI depression in the breast cancer diagnosis. The purpose of this study was to investigate the hopelessness/helplessness *versus* the Beck depression inventory in the BC diagnosis and, thus, to increase awareness of this issue since this knowledge may be useful in the preventive health care.

The unweighted kappa statistics (Cohen's kappa coefficient) is a statistical measure of inter-rater agreement for categorical items. Inter-rater reliability, by comparing the observations of a doctor (ERS) and patients (SRS), is rarely reported in the hopelessness/helplessness. Concurrent validity is assessed by comparing each of the two hopelessness and helplessness ratings *versus* the Beck's depression inventory. Our results indicate that when appropriate scoring (SRS or ERS) is used, the clinical data of hopelessness and helplessness in the BC, BBD and HSS groups can be reliably interrelated to BDI classification. Our findings further suggest that the development of suitable criteria for the identification of clinical symptoms and signs may lead to the reduction of the variability between the observers.

Conclusion

The present study broadens the figure of hopelessness and helplessness and gives new information about depression. The results of this study support a powerful link between hopelessness and helplessness *versus* BDI in the self-rating and examiner-rating. This finding is of clinical importance since, in the breast cancer diagnostic unit, the patients with hopelessness/helplessness characteristics and high BDI score might be associated with a difficulty and delay in reaching BC diagnosis.

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Conflicts of Interest

No conflicts of interest exist. The Authors alone are responsible for the content and writing of this article.

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