

# Suicidal Ideation *Versus* Hopelessness/Helplessness in Healthy Individuals and in Patients with Benign Breast Disease and Breast Cancer: A Prospective Case-control Study in Finland

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**Abstract.** *Background/Aim:* The relation between suicidal ideation versus hopelessness/helplessness in healthy study subjects (HSS) and in patients with benign breast disease (BBD) and breast cancer (BC) has not been compared to date in a prospective study. We, therefore, investigated suicidal ideation versus hopelessness/helplessness in 115 patients. *Patients and Methods:* In the Kuopio Breast Cancer Study, 115 women with breast symptoms were evaluated for hopelessness and helplessness versus suicidal/pessimistic thoughts before any diagnostic procedures were carried-out. *Results:* In the self-rating score (SRS), hopelessness and the helplessness versus pessimistic thoughts were significantly correlated in the HSS, BBD and BC groups. In the SRS, the weighted kappa-values for hopelessness versus pessimistic thoughts in the BBD group were also statistically significant. There was also a significant positive correlation in the examiner-rating score (ERS) in the hopelessness versus pessimistic thoughts in the HSS, BBD and BC groups, as well as in the ERS, in the helplessness versus pessimistic thoughts in the HSS and BBD groups. In SRS, the hopelessness and the helplessness versus suicidal thoughts were significantly correlated in the HSS, BBD and BC groups. There was also a significant positive correlation in the ERS in the hopelessness versus suicidal thoughts in the HSS, BBD and BC groups, as well as in the ERS, in the helplessness versus suicidal thoughts in the BBD group. *Conclusion:* A new finding with

clinical relevance in the present work is the agreement between hopelessness/helplessness versus suicidal/pessimistic thoughts in the self-rating and examiner-rating. In the breast cancer diagnostic Unit, the identification of suicidal ideation is essential in suicide prevention and it is important to assess and treat depression even though a subject reports little suicidal ideation.

A substantial proportion of suicide victims are dying in their first suicide attempt necessitating early recognition of suicide risk (1, 2). In a large cohort of the Finnish national suicide prevention project (n=4,868), 85 % of the most suicidal individuals had contacted general practitioners or other primary care services during the previous 12 months and only 20 percent of the suicidal subjects had made contact with psychiatric services (3); therefore, general practitioners and other primary care services should be more responsive and sensitive to the depression-associated symptoms to identify suicidal behaviour in the general population. Young *et al.* (4) suggested that the identification of a hopeless person is essential in suicide prevention and it is also important to assess and treat hopelessness/helplessness even though a subject reports a few depression-associated signs (5). We assessed hopelessness/helplessness *versus* depression in patients with breast cancer (BC), benign breast disease (BBD) and in healthy study subjects (HSS) (6-9). Our results suggested a specific link between hopelessness/helplessness and depression-associated characteristics in BC. However, the results of hopelessness/helplessness *versus* suicidal ideation in HSS and in patients with benign breast disease (BBD) and breast cancer (BC) have not been compared in a prospective study. 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 (10). Hormonal factors, such as early age at menarche, later age at menopause, later age at first full-term pregnancy and hormone replacement therapy,

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*Key Words:* Hopelessness, helplessness, suicidal ideation, breast disease.

are known to be the main risk factors for sporadic BC (11-17). 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 (11-17).

Psychological factors, such as stressful and adverse life events, are widely thought to play a role in the aetiology of BC (18-38). To our knowledge, the associations between hopelessness/helplessness *versus* suicidal ideation are rarely considered together. Therefore, we carried-out this prospective study to examine the role of hopelessness/helplessness *versus* suicidal ideation in women with breast symptoms referred by physicians to the Kuopio University Hospital.

### Patients and Methods

The Kuopio BC Study was a multi-disciplinary 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 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 (39). 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 (40, 41).

This case-control study was an extension of the Kuopio BC Study (42, 43) and was 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).

*Montgomery-Asberg depression rating scale (MADRS).* Montgomery and Asberg introduced in 1979 an inventory (MADRS) for rapid screening of depression (44). The examiner (P.O.) completed the MADRS with 10 variables and the MADRS was used as a continuous variable in this study. The questionnaire items measuring depression in the MADRS test are the following; (i) apparent sadness, (ii) reported sadness, (iii) inner tension, (iv) reduced sleep, (v) reduced appetite, (vi) concentration difficulties, (vii) lassitude, (viii) inability to feel, (ix) pessimistic thoughts, (x) suicidal thoughts. The MADRS item (ix), pessimistic thoughts represents thoughts of guilt, inferiority, self-reproach, sinfulness,

remorse and ruin yielding a score of 0 to 6. The MADRS item (x), suicidal thoughts represents the feeling that life is not worth living, that a natural death would be welcome, suicidal thoughts and preparations for suicide. Suicidal attempts should not in themselves influence this rating (45).

*Scoring of hopelessness.* The questionnaire items measuring hopelessness in the examiner-rating score (Hopelessness ERS, variable 218) and in the self-rating score (Hopelessness SRS, variable 300) were assessed before any diagnostic procedures for the HSS, BBD and BC groups and are shown in our earlier report of hopelessness (6-9). For correlation coefficient and kappa calculations, the final ERS hopelessness score was rated as follows: Grade 1, euphoric; Grade 2, optimistic; Grade 3, realistic; Grade 4, hopeless/pessimistic. For correlation coefficient and kappa calculations, the final SRS hopelessness score was rated as follows: Grade 1, no hopelessness; Grade 2, seldom hopelessness; Grade 3, sometimes hopelessness; Grade 4, often/strong hopelessness. The mean duration (+ standard deviation (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 in the examiner-rating score (ERS, variable 219) and in the self-rating score (SRS, variable 301) are shown in our earlier study (7-9): For correlation coefficient and kappa calculations, the final ERS helplessness score was rated as follows: Grade 1, self-supporting/no helplessness; Grade 2, independent; Grade 3, balanced; Grade 4, helpless/dependent. For correlation coefficient and kappa calculations, the final SRS helplessness score was rated as follows: Grade 1, no helplessness; Grade 2, seldom helplessness; Grade 3, sometimes helplessness; Grade 4, often/strong helplessness.

*Statistical analysis.* The 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 validity of the ERS and SRS rating mode was calculated from the variance components through appropriate intraclass correlation coefficient (ICC) according to the following formula (46-48):

$$ICC_{mode} = \frac{var(Patients)}{var(Mode) + var(Mode * Patients) + var(Patients) + Var(Item) + var(Patients * Item) + var(Error)}$$

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 (49, 50) and the weighted kappa statistic, where weight matrix cells located on the diagonal (upper-left to bottom-right) represent agreement (51). 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, whereas can assume negative values up to -1 when agreement is less than expected by chance.

Table I. Characteristics of the study participants.

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

BC, Breast cancer; BBD, benign breast disease; HSS, healthy study participants; HRT, hormonal replacement therapy.

## 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 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* pessimistic thoughts in the HSS, BBD and BC groups are shown in Table II. In the SRS, the hopelessness and the helplessness *versus* pessimistic thoughts were significantly correlated in the HSS, BBD and BC groups. In the SRS the weighted kappa values for hopelessness *versus* pessimistic thoughts in the BBD group were also statistically significant (Table II).

The Spearman correlation coefficients and kappa values between hopelessness/helplessness by the ERS *versus* pessimistic thoughts in the HSS, BBD and BC groups are also shown in Table II. There was also a significant positive correlation in the ERS in the hopelessness *versus* pessimistic thoughts in the HSS, BBD and BC groups, as well as in the ERS, in the helplessness *versus* pessimistic thoughts in the HSS and BBD groups.

The Spearman correlation coefficients and kappa values for hopelessness/helplessness by the SRS *versus* suicidal thoughts in the HSS, BBD and BC groups are shown in Table III. In the SRS, the hopelessness and the helplessness *versus* suicidal thoughts were significantly correlated in the HSS, BBD and BC groups. There was also a significant

positive correlation in the ERS in the hopelessness *versus* suicidal thoughts in the HSS, BBD and BC groups, as well as in the ERS, in the helplessness *versus* suicidal thoughts in the BBD group. Figure 1 shows the scatter plots of the individual values of the ERS measuring helplessness (1A) and hopelessness (1B) *versus* pessimistic thoughts and SRS measuring helplessness (1C) and hopelessness (1D) *versus* pessimistic thoughts as a continuous variable for the HSS, BBD and BC groups. Figure 2 shows the scatter plots of the individual values of the ERS measuring helplessness (2A) and hopelessness (2B) *versus* suicidal thoughts and SRS measuring helplessness (2C) and hopelessness (2D) *versus* suicidal thoughts as a continuous variable for the HSS, BBD and BC groups.

## Discussion

Suicidal ideation and suicide attempts (parasuicide) are highly prevalent in the general population and strong risk factors for suicide (52). However, the epidemiology of suicidal ideation and parasuicide has remained a relatively unstudied area. The first published study on the prevalence of the suicidal ideation in a nationwide sample of the general population in Greece (53) showed that 6.8% of the females and 2.8% of the males had thought about suicide during the preceding 12 months. After, however, an in-depth analysis of the study, the corresponding figures for a different population sample were 14.9% for females and 5.9% for males (53). Diekstra and Garnefski (54) estimated a lifetime prevalence of suicidal thoughts in the USA between 15% and 53%. The prevalence of the suicidal ideation in a sample of the Finnish

Table II. The Spearman and intraclass correlation coefficients (ICC) and kappa-values between the self-rating score (SRS) for hopelessness and helplessness versus pessimistic thoughts and the examiner rating score (ERS) for hopelessness and helplessness versus pessimistic thoughts in the HSS, BBD and BC groups.

Group	Spearman (p-value)	ICC (p-value)	Kappa (p-value)	Weighted kappa (p-value)
Rating of hopelessness (SRS) vs. pessimistic thoughts				
HSS	0.529 (0.003)	0.521 (0.002)	-0.128 (0.071)	0.042 (0.449)
BBD	0.703 (<0.001)	0.699 (<0.001)	-0.111 (0.073)	0.121 (0.008)
BC	0.543 (<0.001)	0.511 (<0.001)	-0.080 (0.214)	0.045 (0.210)
Rating of helplessness (SRS) vs. pessimistic thoughts				
HSS	0.598 (<0.001)	0.569 (<0.001)	-0.095 (0.138)	0.062 (0.144)
BBD	0.613 (<0.001)	0.612 (<0.001)	-0.056 (0.359)	0.114 (0.011)
BC	0.380 (0.027)	0.354 (0.019)	-0.065 (0.337)	0.054 (0.258)
Rating of hopelessness (ERS) vs. pessimistic thoughts				
HSS	0.520 (0.004)	0.501 (0.002)	-0.076 (0.136)	0.021 (0.404)
BBD	0.556 (<0.001)	0.507 (<0.001)	-0.096 (0.037)	0.037 (0.232)
BC	0.654 (<0.001)	0.451 (0.003)	-0.019 (0.731)	0.066 (0.159)
Rating of helplessness (ERS) vs. pessimistic thoughts				
HSS	0.508 (0.005)	0.464 (0.005)	-0.055 (0.129)	0.007 (0.619)
BBD	0.447 (<0.001)	0.415 (0.001)	-0.062 (0.092)	0.021 (0.251)
BC	0.278 (0.111)	0.226 (0.096)	0.010 (0.741)	0.005 (0.650)

BC, Breast cancer; BBD, benign breast disease; HSS, healthy study participants.

Table III. The Spearman and intraclass correlation coefficients (ICC) and kappa-values between the self-rating score (SRS) for hopelessness and helplessness versus suicidal thoughts and the examiner rating score (ERS) for hopelessness and helplessness versus suicidal thoughts in the HSS, BBD and BC groups.

Group	Spearman (p-value)	ICC (p-value)	Kappa (p-value)	Weighted kappa (p-value)
Rating of hopelessness (SRS) vs. suicidal thoughts				
HSS	0.623 (0.001)	0.526 (0.001)	-0.048 (0.265)	0.038 (0.311)
BBD	0.481 (<0.001)	0.385 (0.002)	-0.054 (0.054)	0.004 (0.644)
BC	0.561 (0.001)	0.467 (0.002)	-0.061 (0.062)	0.000 (1.000)
Rating of helplessness (SRS) vs. suicidal thoughts				
HSS	0.478 (0.009)	0.390 (0.017)	-0.041 (0.272)	0.028 (0.326)
BBD	0.478 (<0.001)	0.383 (0.002)	-0.050 (0.067)	0.004 (0.644)
BC	0.528 (0.001)	0.375 (0.013)	-0.040 (0.295)	0.012 (0.500)
Rating of hopelessness (ERS) vs. suicidal thoughts				
HSS	0.438 (0.017)	0.378 (0.020)	-0.042 (0.172)	0.012 (0.504)
BBD	0.447 (0.001)	0.316 (0.011)	-0.028 (0.216)	0.003 (0.644)
BC	0.392 (0.022)	0.217 (0.105)	0.006 (0.877)	0.026 (0.262)
Rating of helplessness (ERS) vs. suicidal thoughts				
HSS	0.285 (0.137)	0.251 (0.091)	-0.024 (0.328)	0.004 (0.690)
BBD	0.354 (0.010)	0.284 (0.020)	-0.017 (0.282)	0.000 (1.000)
BC	0.275 (0.115)	0.237 (0.085)	-0.011 (0.500)	0.000 (1.000)

BC, Breast cancer; BBD, benign breast disease; HSS, healthy study participants.

general population (3) showed that 2.4% of the females and 2.3% of the males had thoughts about suicide during the preceding 12 months. Hintikka *et al.* (55) reported the 12-month incidence (3.1%) and prevalence of suicidal ideation (9.2%) being lower in females than males (4.6% and 4.7%). Population-based national data on parasuicide rates have also relatively seldom been reported (56). The true prevalence of

parasuicide cannot be estimated only on the basis of healthcare-services because the official statistics of healthcare include only those parasuicide acts that had caused visits to health care system. In a nationwide sample of the general population from Greece, Madianos *et al.* (53) reported 1.1% of the Greek females and 0.3% of males having attempted suicide during the preceding 12 months.

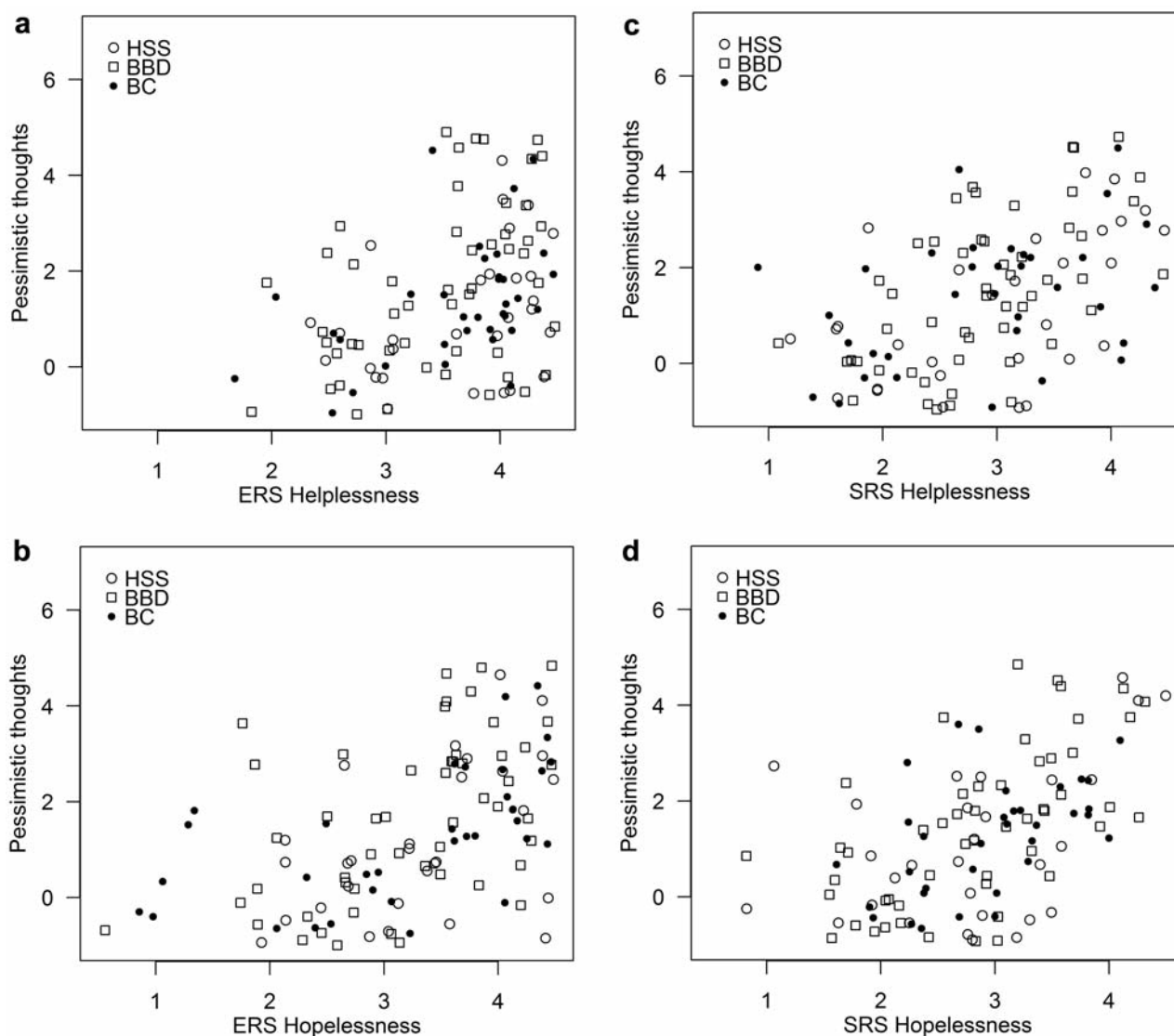


Figure 1. Scatter plots of the individual values of the examiner-rating scores (ERS) measuring helplessness (1A) and hopelessness (1B) versus pessimistic thoughts as a continuous variable and self-rating scores (SRS) measuring helplessness (1C) and hopelessness (1D) versus pessimistic thoughts as a continuous variable for the healthy study participants (HSS), for those with benign breast disease (BBD) and for patients with breast cancer (BC).

Analyzing, however, the same study 6 years later, the corresponding figures were 3.4% for females and 1.5% for males. Hintikka *et al.* (3) reported the prevalence of parasuicide being 0.9% in females and 1.1% in males in a cohort of the Finnish general population ( $n=4,868$ ). Hopelessness and its relation to suicidality has been under discussion and the role of hopelessness as a predictor of suicidality has been speculated and challenged by Mendoca and Holden (57) and Nimeus *et al.* (58). However, hopelessness is shown to be associated with suicidal ideation (59), suicidal intent (60) and suicide attempts (61-62). Recently, the American Association of Suicidology (63) put

statements of hopelessness at the first place on a list of early warnings of suicidality. Therefore, it has been suggested that hopelessness might even be a more important risk factor for suicidality than depression alone (64-65) and hopelessness seems to be a short-term predictor of parasuicide repetition (66) and also long-term predictor of suicide (67).

We assessed hopelessness/helplessness *versus* depression in patients with breast cancer BC and benign breast disease BBD, as well as in HSS (6-9). Our results suggested a high Spearman correlation between hopelessness/helplessness and depression-associated characteristics in breast disease. We have also shown a high Spearman correlation of emotional factors between

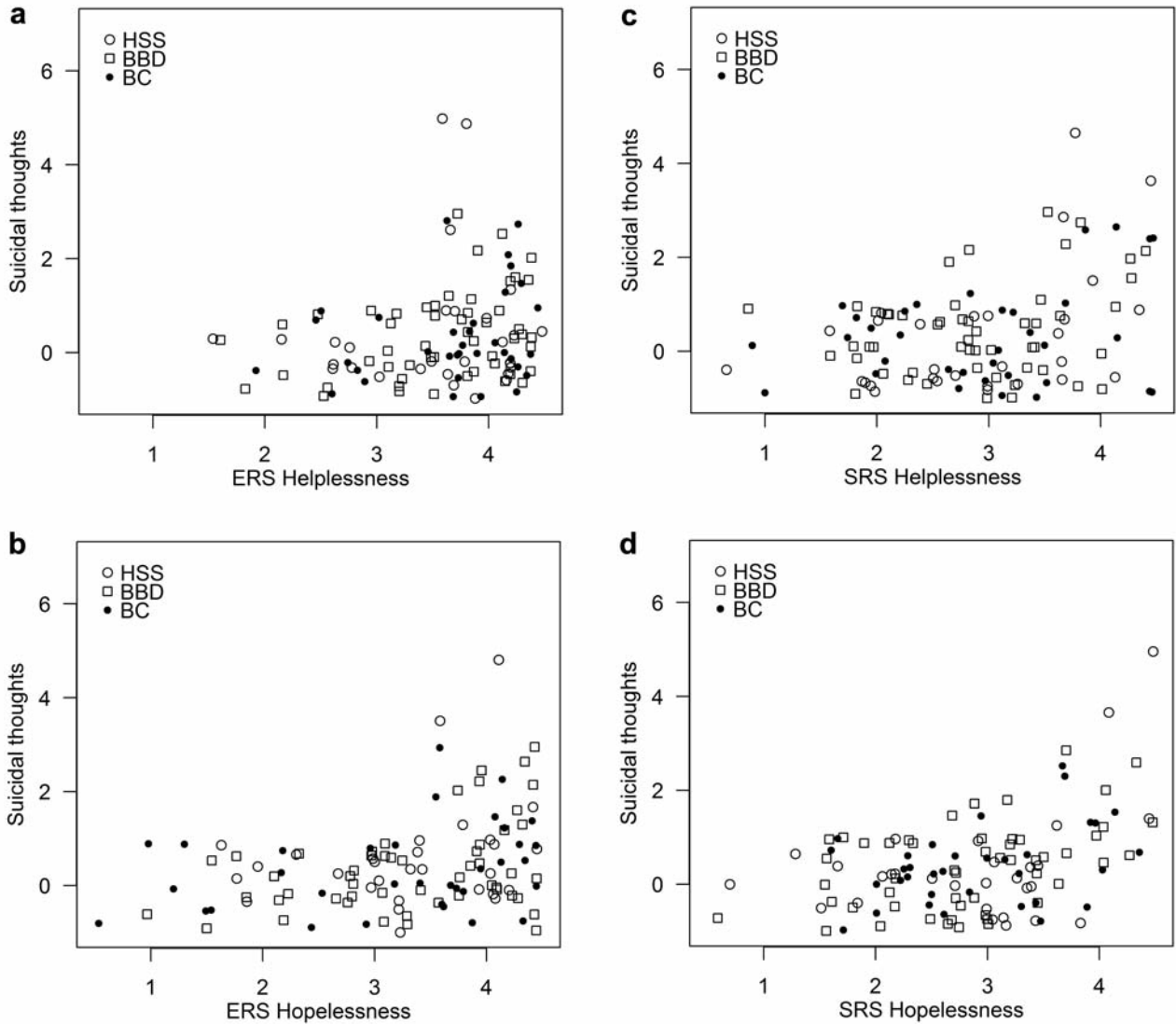


Figure 2. Scatter plots of the individual values of the examiner-rating scores (ERS) measuring helplessness (2A) and hopelessness (2B) versus suicidal thoughts as a continuous variable and self-rating scores (SRS) measuring helplessness (2C) and hopelessness (2D) versus suicidal thoughts as a continuous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

patient-and-physician communication (68, 69). However, the ICC between suicidal ideation *versus* hopelessness/helplessness in HSS and in patients with BBD and BC has not been compared in a prospective study. The ICC is a descriptive correlation coefficient that can be used when measurements are made on Units that are organized into groups and the ICC describes how strongly units in the same group resemble each other. Unlike most other correlation coefficients, it operates on data structured as groups, rather than data structured as paired observations. This study shows that hopelessness/helplessness in the BC, BBD and HSS groups can be reliably correlated to suicidal and pessimistic thoughts in the MADRS classification.

Although there exist no previous reports with this study's design available for sufficient comparison, certain reports of the suicidal ideation *versus* hopelessness/helplessness can be obtained (59-62). It has been suggested that the identification of hopeless/helpless persons is essential in suicide prevention and it is important to assess and treat hopelessness/helplessness even though a subject reports little suicidal ideation symptoms. We assessed hopelessness/helplessness *versus* suicidal and pessimistic thoughts in MADRS classification in patients with BC, BBD and in HSS. Our results suggested a specific link between hopelessness/helplessness *versus* Beck Depression Inventory (BDI) in

breast disease (8). However, the BDI is a self-rating scale and relatively little is known about hopelessness/helplessness *versus* examiner-rating MADRS depression scale in the breast cancer diagnosis. The purpose of the study was to investigate the hopelessness/helplessness *versus* the suicidal and pessimistic thoughts in the MADRS 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.

## Conclusion

The present study provides new information on suicidal ideation supporting agreement between hopelessness/helplessness in the self-rating and examiner-rating *versus* suicidal/pessimistic thoughts. In the breast cancer diagnostic unit, the identification of persons with suicidal ideation is essential in suicide prevention and it is also important to assess and treat hopeless/helpless persons.

## Conflicts of Interest

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

## Acknowledgements

The support from the Academy of Finland, Paavo Koistinen Foundation and EVO funds from Kuopio University Hospital are gratefully acknowledged. Our special thanks are due to Ms. A.K. Lyytinen, R.N. for help in data collection and Ms. E. Oittinen for excellent technical assistance.

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*Received March 3, 2015*

*Revised March 12, 2015*

*Accepted March 16, 2015*