

# Relationship between sense of coherence and quality of life in early stage breast cancer patients

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**Objective.** Various investigations have shown the sense of coherence to influence quality of life: the stronger the sense of coherence, the better quality of life. The interrelation between the sense of coherence and quality of life among cancer patients has not been given comprehensive studies. The aim of the present investigation was to analyse the interrelation between the sense of coherence and quality of life in Lithuanian females with early stages of breast cancer in the early post-operative period.

**Materials and methods.** The study cohort included 100 female patients with cT1–T2 / N0–N1 / M0 stages of breast cancer, treated at the Breast Surgery and Oncology Department, 4–12 days after surgery. The study participants filled in the EORTC QLQ-C30, EORTC QLQ-BR23 quality of life questionnaires and the Sense of Coherence Scale SOC-13.

**Results.** Females with a higher level of sense of coherence after breast conserving treatment showed a better emotional functioning and suffered less fatigue and pain. Females with a higher level of the sense of coherence after breast conserving treatment had more rare systemic therapy side effects and breast and arm symptoms. After mastectomy, patients with a higher level of the sense of coherence showed a better physical, emotional, cognitive and social functioning, they were less suffering from fatigue and loss of appetite, and also more rarely had financial difficulties, more rarely complained of systemic therapy side effects and breast symptoms, they felt less stressed by body image and future perspective changes. The difference was statistically significant ( $p < 0.05$ ).

**Conclusions.** Our findings suggest that the sense of coherence could be essential for the quality of life of breast cancer patients in the early post-operative period.

**Key words:** sense of coherence, quality of life, breast cancer

## INTRODUCTION

During the last decades, much research has been carried out in Lithuania (1, 2) and in other countries (3) on quality of life in breast cancer patients, but the analysis of scientific investigations (4) has shown that information on the psychosocial aspects of breast cancer is contradictory. Most investigators analysed the role of psychosocial aspects for survival from breast cancer (5–9). They found that even after controlling for cancer stage and size at diagnosis and treatment, unmarried women were at a higher risk of death from breast cancer in comparison with married (7). Also, other personal factors (e. g. being a parent) may be especially important in breast

cancer survivors (10). Vos et al. (11) showed that in the early post-surgery period, the coping style, especially illness-specific coping, is of high relevance for psychosocial adjustment. Biodemographic variables had both direct and indirect relations with psychosocial adjustment: older women and women after breast-conserving treatment used a more optimistic coping style; the latter group also reported a better body image; and finally, women with a more advanced stage of disease reported a reduction in recreational activities (11).

A weak sense of coherence and a more negative attitude toward cancer (i. e. viewing victims of cancer with pity, viewing the illness as a death sentence, harboring a fear of death from cancer) predict a high level of psychological distress (12).

The concept of the *sense of coherence* was proposed by A. Antonovsky (13). It is based on salutogenesis theory which analyses the psychosocial preconditions of health. In his opinion, the three components of Sense of Coherence

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are *comprehensibility*, *manageability* and *meaningfulness*. Comprehensibility means that whatever happens to a person, he is able to make sense of it and understand it as structured, predictable, and explicable. Manageability means that either the resources are available to meet the demands posed by the stimuli or there are ways to find them. Meaningfulness involves having a sense of meaning in the important areas of one's life or recognizing these demands as challenges, worthy of investment and engagement.

M. Cederblad et al. (14) state that A. Antonovsky's model can be used for explaining the machinery by which various variables help to strengthen health.

The sense of coherence is a personal feature which forms at the age of about 30 years; later the sense of coherence (SOC) remains more or less stable. However, the SOC level can change under the impact of strong emotional trials, such as convulsions of nature or civil convulsions (13). Persons with a high level of SOC outlive stressful situations more easily and have better stress coping mechanisms (15).

Various researchers maintain that the sense of coherence has a statistically significant connection with quality of life (16). Fok et al. (17) have found that people who suffer from a severe illness but have high a level of SOC are able to take the initiative and attribute to themselves responsibility for their health. Research on patients with chronic diseases has revealed that all the patients have family problems, but patients with a higher SOC feel better and are able to take care of themselves and to manage their health control (18). Cohen et al. (19) state that the ability to cope with a stressful situation and to control it is one of the factors most essential for quality of life. In the opinion of Bruscia et al. (20), Motzer, Stewart (21), Spadoti Dantas et al. (22), the level of SOC and SOC strengthening can influence the quality of life and is its predictive factor. The sense of coherence and hope were also direct predictors of psychological well-being of breast cancer patients (6). Other investigators found a relation between the sense of coherence in cancer patients and the level of distress they experience (23). Investigations in Lithuania (24) have shown that cancer patients with a higher level of SOC cope more successfully with the disease in comparison with patients whose SOC level is lower.

The aim of the present investigation was to analyse the relation between the sense of coherence and quality of life in Lithuanian females with early stages of breast cancer.

## MATERIALS AND METHODS

This open prospective non-randomized study was carried out in September 2007 through February 2008 at the Breast Surgery and Oncology Department of the Institute of Oncology, Vilnius University. The study included 100 female patients with cT1–T2 / N0–N1 / M0 stages of breast cancer. The following exclusion criteria were considered: no breast cancer, language problems, unwillingness to participate. The Bioethics Committee of the Institute of Oncology, Vilnius University

approved the study protocol and consent procedures. The informed consent was signed by 104 women, of them four were not included because they did not fill in the questionnaire.

Twelve days after breast surgery, the study participants filled in the EORTC QLQ-C30, EORTC QLQ-BR23 questionnaires and Antonovsky's (13) Sense of Coherence Scale (SOC-13). Sociodemographic and biological data were collected from patients' hospital case-records.

### The Sense of Coherence Scale

The sense of coherence reflects a person's ability to perceive life as comprehensible, manageable and meaningful. A short 13-item form of the SOC scale was used to estimate the respondents' sense of coherence (13, 25). This form is generally accepted, reliable and valid (16). The standard forward-backward translation procedure by permission of author was used to translate the English version of the SOC-13 scale into Lithuanian. The reliability and validity of the Lithuanian version of SOC-13 scale was confirmed by scientific investigations with cancer and AIDS patients (24, 26).

SOC-13 has a 7-point Likert scale format. Five questions measure comprehensibility, four manageability and four meaningfulness. A sum of SOC-13 scale points was calculated. A higher number suggested a stronger SOC: 13–40 points corresponded to a low SOC, 40–54 points to a moderate SOC, 80 and more points to a high SOC.

Cronbach's alpha coefficient for the SOC-13 scale in this study was 0.75.

### EORTC QLQ-C30 and EORTC QLQ-BR23 questionnaires

The quality of life (QOL) questionnaire EORTC QLQ-C30 and its breast cancer module EORTC QLQ-BR23 were used for QOL. The permission to use EORTC QLQ-C30 and EORTC QLQ-BR23 for this study was obtained from the EORTC Quality of Life Group. The translation of the core questionnaire and the breast cancer module into Lithuanian followed the procedure that has been documented in detail in the EORTC Quality of Life Group manual (27).

The core questionnaire (QLQ-C30) includes five scales of functioning, three symptom scales, a global QOL scale, and six individual items. The five functioning scales include physical, role, cognitive, emotional functioning, and social functioning. The three symptom scales include fatigue, nausea and vomiting, and pain. The Global QOL scale includes two items, and six single items were indicators of dyspnea, sleep disturbance, appetite loss, constipation, diarrhea, and financial impact. All items are scored on a 4-point Likert scale ranging from 1 ('not at all') to 4 ('very much'), with the exception of two items in the global health / QOL scale which uses modified 7-point linear analog scales. All of the scales and single-item measures range in score from 0 to 100. A high-scale score represents a higher level of response (28). QLQ-C30 was field-tested and found to be a reliable and valid tool for assessing the QOL of cancer patients in international clinical trials (29).

The breast cancer module EORTC QLQ-BR23 is meant for use among patients with breast cancer varying in disease stage and treatment modality (i. e. surgery, chemotherapy, radiotherapy and hormonal treatment) (30). The breast cancer module incorporates five multi-item scales to assess systemic therapy side effects, arm symptoms, breast symptoms, body image and sexual functioning. In addition, single items assess sexual enjoyment, hair loss and future prospects. The module has been developed according to the guidelines and approved after a formal review. It had been field-tested in a larger cross-cultural study involving 12 countries (EORTC Protocol 15931).

The EORTC QLQ-C30 and EORTC QLQ-BR23 questionnaires in our study demonstrated a high reliability (Cronbach's alpha coefficient was 0.81 and 0.80).

### Statistical analysis

The Statistical Packages of Social Sciences (SPSS) software for Windows (version 11.0) was used. Descriptive statistics were used to characterize the sample with regard to demographic and clinical characteristics. The reliability was tested using Cronbach's alpha reliability coefficient. For comparison among the groups, the t test was used. Bivariate associations were investigated between SOC and each of the QOL measures, using Analysis of Variance (ANOVA). A p value of 0.05 was considered to be significant.

Associations between SOC and QOL were investigated separately in patients after mastectomy and BCT. We ana-

lysed the possible relationships between the SOC level (high, medium and low) and the subdimensions of EORTC QLQ-C30 and QLQ Br-23 in the BCT and mastectomy groups.

## RESULTS

### Sample characteristics

The mean age was 56.6 years (range: 27–80). The most common treatment was breast conservation n = 64 (64%). Generally, the participants were aged over 50 (68%), working (56%) and had technical school or lower education (65%), and a higher proportion of patients were married (59%). The clinical and sociodemographic characteristics of respondents, compared by the surgery method (BCT versus mastectomy), are outlined in Table 1.

### The relationships between SOC and the QOL subdimensions in BCT group

The analysis showed that women with a high level of the sense of coherence after breast-conserving treatment showed a statistically significantly ( $p = 0.001$ ) better emotional functioning than those with a moderate level; females with a high level of the sense of coherence suffered less from fatigue and pain than those with a moderate and low levels (Table 2).

Females with a high and moderate level of sense of coherence after breast-conserving treatment more rarely developed systemic therapy side effects and breast and arm symptoms than those with a low level (Table 3).

Table 1. Demographic and clinical characteristics of patients according to surgery method

Characteristics	Total (n = 100)	Surgery method		
		BCT (n = 64)	Mastectomy (n = 36)	p
Age				
Under 50	32.0%	37.5%	22.2%	0.126
50 and over	68.0%	62.5%	77.8%	
Education				
Secondary or professional	65.0%	59.4%	75.0%	0.132
University	35.0%	40.6%	25.0%	
Marital status				
Married	59%	60.9%	55.6%	0.674
Unmarried	41%	39.1%	44.4%	
Employment				
Employed	56.0%	64.1%	41.7%	<b>0.037</b>
Unemployed	44.0%	35.9%	58.3%	
Tumour stage				
I	39.0%	53.1%	13.9%	<b>0.000</b>
II	61.0%	46.9%	86.1%	

Table 2. Significant differences in mean EORTC QLQ-C30 scores according to SOC level in BCT group

Scales	Low SOC	Moderate SOC	High SOC	p
Emotional functioning, mean (SD)		47.05 (27.21)	82.58 (29.22)	0.001
Fatigue, mean (SD)		42.13 (29.26)	10.10 (15.28)	0.002
	48.9 (23.04)		10.10 (15.28)	0.027
Pain, mean (SD)	53.33 (38.01)		15.15 (20.35)	0.037

Table 3. Significant differences in mean EORTC QLQ-BR23 scores according to SOC level in BCT group

Scales	Low SOC	Moderate SOC	High SOC	p
Systemic therapy side effect, mean (SD)	41.90 (23.43)	22.52 (12.84)		0.007
	41.90 (23.43)		16.02 (7.76)	0.002
Breast symptoms, mean (SD)	48.33 (29.70)	20.66 (16.58)		0.004
	48.33 (29.70)		10.61 (15.41)	0.001
Arm symptoms, mean (SD)	80.00 (24.09)	26.16 (21.92)		0.0001
	80.00 (24.09)		16.16 (17.47)	0.0001

No association among the other subdimensions of QOL and the SOC was found in the BCT group.

#### Relationship between SOC and QOL subdimensions in the mastectomy group

Patients after mastectomy with a higher level of the sense of coherence showed a better physical, emotional, cognitive and social functioning, they suffered less from fatigue and appetite loss and also more rarely had financial difficulties (Table 4).

Patients after mastectomy with a higher level of the sense of coherence more rarely complained of systemic therapy side effects and breast symptoms, they felt less stressed by body image and future prospects (Table 5). The differences were found to be statistically significant ( $p < 0.05$ ).

No relationship between the SOC level and other subdimensions of QOL were found in the mastectomy group.

## DISCUSSION

Our results have confirmed the hypothesis that in the early stage of breast cancer Lithuanian women whose SOC was higher enjoyed a better quality of life in comparison with women whose SOC was lower. These results agree with the

conclusions of Johanson et al. (31), Salmon (32) and other researches.

The results of our study have shown that SOC is connected with the experience of side effects of treatment. By the data of EORTC QLQ-BR23 subscales, women after breast-conserving treatment with a high level of SOC more rarely complained of symptoms concomitant with the side effects of treatment and related to breast and hand functioning. After mastectomy, women whose SOC was medium more rarely experienced side effects of treatment and symptoms related to breast in comparison with women whose SOC was low. These results differ from those reported by Debess, Ewertz (33). These authors investigated the relationship between SOC and side effects among women who had received adjuvant chemotherapy after operation for breast cancer and concluded that there was no associations between SOC and side effects.

The limitation of our study was that such side effects of systemic therapy as dry mouth, different than usual food and drink taste, painful, irritated or watery eyes, hair loss, hot flushes and headaches are usually uncommon in the early post-operation period.

Reasons for the better quality of life in women with a high sense of coherence were analysed. The main reason

Table 4. Significant differences in mean EORTC QLQ-C30 scores according to SOC level in mastectomy group

Scales	Low SOC	Moderate SOC	High SOC	p
Physical functioning, mean (SD)	52.00 (22.40)	71.67 (14.81)		0.025
Emotional functioning, mean (SD)	40.83 (26.77)		87.50 (6.97)	0.011
Cognitive functioning, mean (SD)	48.33 (22.84)	79.17 (20.86)		0.001
	48.33 (22.84)		86.11 (12.55)	0.003
Social functioning, mean (SD)	41.67 (22.57)		88.89 (17.21)	0.002
Fatigue, mean (SD)	64.44 (19.46)		29.63 (31.95)	0.046
Appetite loss, mean (SD)	50.00 (45.13)	10.00 (21.90)		0.007
Financial difficulties, mean (SD)	70.00 (29.19)	30.00 (40.32)		0.025

Table 5. Significant differences in mean EORTC QLQ-BR23 scores according to SOC level in mastectomy group

Scales	Low SOC	Moderate SOC	High SOC	p
Body image, mean (SD)	32.50 (26.19)	67.08 (24.70)	32.50 (26.19)	0.004
	32.50 (26.19)		32.50 (26.19)	0.003
Future prospects, mean (SD)		26.67 (36.83)	72.22 (25.09)	0.007
	3.33 (10.54)		72.22 (25.09)	0.0001
Systemic therapy side effects, mean (SD)	39.52 (12.51)	23.10 (12.77)		0.017
Breast symptoms, mean (SD)	40.83 (16.87)	22.08 (21.68)		0.038



may be that these females are able to cope better with the stress related to cancer diagnosis. Results obtained by other investigators confirm these data. Gustavsson-Lilius et al. (23) examined the sense of coherence and distress among cancer patients and their spouses and found that a strong SOC was associated with a lower distress. Their results supported A. Antonovsky's (13) theory that a strong SOC protects from the development of distress.

Kenne Sarenmalm et al. (34) examined 56 postmenopausal women newly diagnosed with recurrent breast cancer and found that the sense of coherence was the only significant predictor of distress. These researches maintain that care must be based upon the ability to adapt to breast cancer.

The significance of the present investigation lies in the fact that its results extend and put flesh on previously reported results. It confirms that female patients with a high level of SOC have a better quality of life after breast surgery.

In M. Gustavsson-Lilius et al. (23) investigation of cancer patients, the SOC was not a stable disposition. Travado et al. (35) examined 50 breast cancer patients and came to the conclusion that SOC was a protective factor and, if fostered, may help cancer patients deal better with the uncertainty of their lives in the face of their illness. The results of our investigation imply that it would be possible to improve the quality of life of women with breast cancer by strengthening their SOC.

In the opinion of Shapiro et al. (36), the biomedical model of the disease, though crucial, does not take into account all of the complex factors involved in cancer. So a broader, more integrative framework including psychosocial factors is needed. The limitations of this research are that there were only 36 patients in the mastectomy group and that there were significant differences in employment and in tumour stage in different surgery groups. Both unemployment and suffering from stage 2 instead of stage 1 could be detrimental to quality of life.

In the further investigations, it would be important to analyse the possible influence of the sociodemographic status on associations between the sense of coherence and quality of life.

## CONCLUSIONS

Breast cancer patients with a higher sense of coherence seem to experience less side effects of treatment and have a higher health-related quality of life in the early post-operative period.

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#### ANKSTYVOSIOMIS KRŪTIES VĖŽIO STADIJOMIS SERGANČIŲ PACIENČIŲ VIDINĖS DARNOS IR GY- VENIMO KOKYBĖS SĄSAJOS

##### Santrauka

**Tikslas.** Tyrimai rodo, kad vidinė darna turi įtakos gyvenimo kokybei: kuo stipresnė vidinė darna, tuo geresnė gyvenimo kokybė. Onkologinių pacientų vidinės darnos ir gyvenimo kokybės sąsajos iki šiol yra nepakankamai tyrinėtos. Šio tyrimo tikslas buvo iširti Lietuvos moterų, sergančių ankstyvųjų stadijų krūties vėžiu, vidinės darnos ir jų gyvenimo kokybės sąsajas ankstyvuojų pooperaciniu periodu.

**Metodika.** Tyrime dalyvavo 100 pacientų, kurioms diagnozuotos cT1–T2 / N0–N1 / M0 krūties vėžio stadijos. Krūties chirurgijos ir onkologijos skyriuje po operacijos jos buvo gydomos 4–12 dienų. Tyrimo dalyvės užpildė gyvenimo kokybės klausimynus EORTC QLQ-C30, EORTC QLQ-BR23 ir trumpąją vidinės darnos skalės variantą SOC-13.

**Rezultatai.** Moterų po krūtų tausojančio gydymo, pasižyminčių stipresne vidine darna, emocinė būklė buvo geresnė, jos mažiau kentė dėl nuovargio ir skausmo. Tokioms moterims rečiau pasireiškė pašalinis gydymo poveikis, su krūtimi bei ranka susiję simptomai. Moterų po mastektomijos, pasižyminčių stipresne vidine darna, buvo geresnė fizinė, emocinė, kognityvinė ir socialinė būklė, jas mažiau vargino nuovargis, apetito sutrikimai, jos rečiau pergyveno dėl finansinių sunkumų. Šioms moterims rečiau pasireiškė pašalinis gydymo poveikis ir su krūtimi susiję simptomai, jos mažiau išgyveno dėl pasikeitusio kūno ir ateities perspektyvų. Nustatyti skirtumai buvo statistiškai reikšmingi ( $p < 0,05$ ).

**Išvada.** Mūsų tyrimo rezultatai leidžia teigti, kad ankstyvuojų pooperaciniu periodu krūties vėžiu sergančios pacientės, turinčios stipresnę vidinę darną, pasižymi geresne, su sveikata susijusia gyvenimo kokybe.

**Raktažodžiai:** vidinė darna, gyvenimo kokybė, krūties vėžys