Social support and self-esteem in patients afflicted with cancer in the reproductive organs, including breasts.

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ABSTRACT
Social support is generally considered as having positive effects on cancer patients' health and well being by supporting the patient to manage the crisis. But, a cancer diagnosis and its treatment do often have negative effects on self-esteem and the cancer patients' life-concepts. The relationship between perceived social support and self-esteem among cancer patients were identified and explored in present study. Two hundred and sixteen respondents, living in the south of Sweden, completed the Norbeck Social Support Questionnaire and the Rosenberg Self-Esteem Scale. The sample consisted of 116 females and 100 males, ranged in the age from 26 to 82. The majority of the sample was married, had children and grandchildren. The average duration of illness was 5 years. The average number of people in each network was 8.0, and relatives and friends were most frequently listed. The majority of the sample scored high self-esteem and statistical significance was shown in relation to age. No statistical significance was shown with respect to self-esteem and social support, but moderate correlations were found. Strongest correlations were found between emotional support and self-esteem. Increased knowledge about cancer patients' long-term experiences is needed in order to perceive them as patients with a chronic disease.

Key words: Cancer patients, Self-esteem, Social support,

INTRODUCTION
Cancer is one of the most common causes of death in Sweden today, second only to cardiovascular disease. During 1998 about 43,000 cancer incidences were reported to the Swedish Cancer Registry. The most common form of cancer in Swedish women is breast cancer, and for Swedish men it is prostate cancer, with approximately 6,000 cases a year respectively. Most people consider cancer, as a life-threatening disease for which there is a poor prognosis. The fact that cancer causes physical suffering and loss of productive years across all segments of the lifespan is well known. There is also a lifelong fear of recurrence or being taken ill with a new form of cancer. This fear or uncertainty is common in both acute and chronic illness during all phases of the disease and is a great source of stress for the patients and their families.

Cancer patients may experience an altered body image simply from the diagnosis while physical change results from surgery or treatments. Cancer diseases are also often associated with a decrease in psychological functioning.
A cancer diagnosis worries and brings about unpleasant feelings for the patients, their families and for people close to the patients. According to Lewis, cancer invades the family, not just the diagnosed patient's body. A cancer disease as well as its treatment may bring psychological,
anatomical and physical changes that may affect sexual functioning, fertility as well as the patients' self-esteem\cite{13,14,15}. How the patient's self-esteem is affected and how the patient will be able to deal with this new situation depends upon the social support they will have\cite{16,17}. Therefore one emerging area for researchers to explore is the relationship between cancer, self-esteem and the need of social support\cite{18}.

**SOCIAL SUPPORT**

The concept of social support has been around for a long time, but in relation to health, social support has been considered as old wine in a new bottle\cite{19}. The literature provides various definitions of social support, but many of them are vague and circular. Therefore, the term is used widely and often refers to mechanisms by which interpersonal relationships protect people from negative effects of stress. Despite the different meaning of the term, social support has been claimed to have a positive outcome on physical health and mental well-being\cite{20}. Individuals who provide social support are collectively referred to as the social support network. These people can include friends, family members, teachers, clergy, health care givers and other patients\cite{21,22}. A study by Kesselring et al.\cite{23} show that patients with low social support and small social networks need more attention and support from the nurse.

According to Peltonen\cite{24} social support can evolve in three different levels. The primary level is associated with close family and friends, the second level includes other friends, relatives, neighbours and workmates while the tertiary level comprises groups of personnel in public and private organisations, i.e. health care as well as the social security-system, the church, the school and/or voluntary organisations.

The primary level of support is most suitable for giving emotional and practical support when needed. Lack of support, or support given at the wrong time, could bring about negative consequences for the person. Secondary and tertiary level of support is related to the culture, political and religious ideologies and values in the society.

Even if social support in general seems to have a positive effect on health it may also provide distress, if significant others react with fear or feelings of aversion towards the cancer patient\cite{25}. If an open communication about the cancer and its consequences are not possible then the patient might feel abandoned and rejected.

Norbeck\cite{18} developed a model, which can be used as a guide for building a body of knowledge about the patient's social environment for clinical practice.

Norbeck et al\cite{18,26} has not defined social support. Instead they refer to Kahn\cite{27}, who defines social support as interpersonal transactions that include one or more of the following: "the expression of positive affect on one person towards another; the affirmation or endorsement of another person’s behaviour, perceptions or expressed views; the giving of symbolic or material aid to another" (p 85). Affect, (i.e. admiration, respect, love), affirmation, (i.e. expressions of agreement) and aid (direct aid or assistance) are the key elements in the supportive transactions. Kahn\cite{27} uses a metaphorical term, ‘the convoy’, when describing that each person can be thought of as moving through life surrounded by a set of significant other people to whom that person is related by receiving or giving social support. ‘The convoy’ consists of an individual and a set of other people defined in terms of their relationship to that individual.

**SELF-ESTEEM**

To give a definition of self-esteem is difficult, since definitions often are contextual and related to a given level of knowledge. Despite this, several definitions are found in the literature; Feather and Wainstock\cite{27} defined self-esteem as the sum total of all that a person feels about herself, while Brandon\cite{28} defined self-esteem as "the disposition, to experience oneself as competent to cope with the basic challenges of life and as worthy of happiness" (p 27). Curbow et al.\cite{4} has defined self-esteem as the affective component of the self-concept, which describes an attitude, feeling or evaluation concerning the self. Self-esteem can be based upon feelings about body-image following, for example, a mastectomy, or it can be used as a global term, and as such measured by instruments like Rosenberg Self-Esteem Scale, RSE\cite{29}. Psychological distress, as seen within cancer patients, is associated with low self-esteem\cite{30}. Johnson\cite{5} has distinguished between self-esteem as basic self-love and self-esteem as related to competence and defined self-esteem as "the degree of worth, value, respect and love that the individual may hold for himself as a human being in the world" (p 8). According to Brandon\cite{28} self-esteem is a basic need; a need, deep in our personalities to feel loved and accepted. Self-esteem has two interrelated components, self-efficacy and self-respect. Self-efficacy describes people with confidence in the function of their minds, in their ability to think and to understand the facts of reality within the sphere of interest and needs. Self-efficacy is also related with peoples’ self-trust and self-reliance. When people experiences self-efficacy they
also generate a sense of control over their lives, which contributes to their well-being. Self-respect means assurance of one's values; one rights to live and to be happy. Self-concept is the cognitive part of self and is dealing with what the individuals think of self, while self-esteem is concerned with what the individuals feels about what they think of self. 

STUDIES OF SOCIAL SUPPORT AND SELF-ESTEEM

Maunsell et al.²² assessed the relationship of social support among women diagnosed with breast cancer and after seven years of survival. The result from this study supported the view that social support may be associated with longer survival among women with breast cancer. In a study by Krishnasamy³³ social support was identified as beneficial to cancer patients in their adjustment to cancer-related stress. But this study also pointed out that those who have cancer might especially be likely to experience difficulties in obtaining adequate support, because of the fears and stigma associated with cancer. Social support was regarded by the researchers as significant to cancer patients' psychosocial well-being³⁴, ³⁵. The need for social support increases when people are diagnosed with cancer, and these needs can be met by family, friends, nurses, physicians and others³⁶, ³⁷. In a qualitative study about social support and long-term survivors of AIDS³⁸, social support was interpreted as 'being in relation to others', including dealing with one's own family, renegotiating their friendship group, helping others with HIV, and developing a relationship with a higher power.

In a study by Rose³⁹ cancer patients reported that primary sources of support were manifested by patients' overall preference for tangible aid from family, modeling from friends who had cancer, and open communication from health professionals.

Studies have been conducted on social support and cancer patients in Egypt, Taiwan and Switzerland³⁰, ³¹, ³², ³³. In the studies conducted in Egypt and Switzerland, the Norbeck Social Support Questionnaire (NSSQ)³⁸, ³⁹ was used, while in the Taiwanese study, the NSSQ was modified. The findings of these three studies showed that the samples were found to have quite a stable social networks, comprising of people listed in the network who were known by the patients for more than five years. The total number of persons included and listed in the social support network, consisted mostly of family or relatives and the findings also showed that the majority of the patients were married. The mean number listed by the Swiss cancer patients as social support network was 9.3; for the Taiwanese cancer patients, it was 10.25 and for the Egyptian cancer patients, the mean number was 14.78. In a study by Lugton³⁶ neighbours are a better source of support when it comes to time-urgent tasks while friends are most useful for tasks involving shared values. A large social network provides a greater variety of supports.

A diagnosis of cancer and the following treatment, with many well-known side effects, might in a dramatic way change peoples' life-concept as well as their self-esteem. In a study by Munstedt et al.¹¹ 46.6% of the patients who received alopecia inducing cancer chemotherapy found this to be the most traumatic side-effect of the therapy. Furthermore, as much as 73.3% of the patients reported that they did not feel as self-confident as before the treatment. Lewis et al.²³ stated in a study that patients who had undergone a surgical treatment for cancer had lowest self-esteem eight weeks after the diagnosis. Frank-Stromberg³⁴ showed in another study that the level of self-esteem increased in 13% among the participants while 18% reported a decreased self-esteem. The studies show differences, which might be explained by the fact that they were carried out in different contexts and focused on different patient-groups. How self-esteem was measured also differed. The hypothesis that people with low self-esteem have less defined concepts of what or who they are in terms of their personality is supported in four studies by Campbell³⁵. Low self-esteem is also associated with negative affective states, irritability, impulse to aggression, anomia, and low life-satisfaction³⁶.

The aim of the present study is to identify and explore the relationship between perceived social support and self-esteem among cancer patients. The questions addressed were as follows: (i) What kind of sources of social support are there? (ii) What types of social support are available for these cancer patients? (iii) How does the cancer patients score their self-esteem? (iv) Does social support affect self-esteem?

MATERIALS AND METHODS

Subjects
Criteria were set to establish the research population: (a) had to be an adult, older than 18 years; (b) diagnosed with a cancer related to reproductive organs including breast-cancer during the period of 1990-1995 and (c) had to be registered as a patient at the County Hospital, in southern Sweden.

The total population during 1990-1995 included
approximately 2300 patients with this type of diagnosis. The goal was to reach a stratified sample of 1:10 in each group of cancer diagnoses, giving about 230 patients. Permission to carry out the study was received from the Committee on Research Ethics in the region. Permission was also received by the Swedish Data Inspection Board to identify patients in the cancer registry. The cancer registry in the region of southern Sweden identified the patients and sent this information to the researchers, who forwarded it to the responsible physicians. Those physicians had to make a final judgement regarding the patients' health status and whether they could participate in the study or not. Reasons for excluding some patients were depression, psychological instability, dementia, or not speaking Swedish. The depression and psychological instability criteria were set as a stipulation from the cancer registry and the physicians, in order not to offend the ethical rule of not causing harm. A few patients had moved out of the County and some had died during the time. The remaining 335 patients received invitations to participate in the study from the physicians responsible. Two hundred and eighty-nine patients gave a positive response to participate; but after having received the questionnaire 216 fulfilled the study by answering the background variables and the two instruments. The sample became 216 persons, a response rate of 74.74%. Reasons for dropouts were identified as aggravated disease (e.g. too ill to be able to answer the questionnaire) or death in most cases. Some questionnaires were returned unfulfilled regarding the Norbeck Social Support Questionnaire (NSSQ) with comments like: 'I can't manage to fill in the questionnaire' or 'I do not want to grade my relatives and my friends'. Some questionnaires were also returned unfulfilled regarding the Rosenberg Self-Esteem Scale (RSE) with comments like: 'I will not answer this, since I do not understand what connection does self-esteem have to my cancer' or 'I think it is insulting to grade these kind of statements'. Thus, the remaining respondents answering both the NSSQ and RSE were 216.

THE INSTRUMENTS

The Norbeck Social Support Questionnaire
Norbeck Social Support Questionnaire (NSSQ) was developed in order to measure multiple components of social support. Respondents were asked to list and rate identified people in their social networks that they perceived as providers of support. Network size range from 1 to 20 members. The individuals listed are identified according to nine sources of support categories as follows: spouse/partner, family member/relative, friends, work/school associates, neighbours, health care providers, counsellor/therapist, religious person/priest, or others.

Using a Likert scale, respondents rated each member of the network on three subscales of social support (affect, affirmation, aid), functional network properties (number, duration, and frequency), and recent losses of network members. The items were scored by the value assigned by the respondents on a 1-5 scale. An adjustment of the first six items were made by the designer of the instrument, changing the value from 1-5 scale to 0-4 scale, to ensure that 0, would mean 'not at all'. See Table 1 for the wording of the items.

Table 1. The wording of the items in the NSSQ

<table>
<thead>
<tr>
<th>Item</th>
<th>How much does this person make you feel liked or loved?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>How much does this person make you feel respected or admired?</td>
</tr>
<tr>
<td>Item 3</td>
<td>How much can you confide in this person?</td>
</tr>
<tr>
<td>Item 4</td>
<td>How much does this person agree with or support your actions or thoughts?</td>
</tr>
<tr>
<td>Item 5</td>
<td>If you needed to borrow $10, a ride to the doctor, or some other immediate help, how much could this person usually help?</td>
</tr>
<tr>
<td>Item 6</td>
<td>If you were confined to bed for several weeks, how much could this person help you?</td>
</tr>
<tr>
<td>Item 7</td>
<td>How long have you known this person?</td>
</tr>
<tr>
<td>Item 8</td>
<td>How frequently do you usually have contact with this person? (Phone calls, visits, or letters)</td>
</tr>
<tr>
<td>Item 9</td>
<td>During the past year have you lost any important relationships due to moving, a job change, divorce or separation, death, or some other reason?</td>
</tr>
</tbody>
</table>

If yes, please indicate the number of persons.............

| Item 1-4 | emotional support, score 0-4 |
| Item 5-6 | tangible support, score 0-4 |
| Item 7 | duration of relationships, score 1-5 |
| Item 8 | frequency of contact, score 1-5 |
| Item 9 | loss, a dummy question |

Test-retest Pearson Correlation reported for the subscales were: affect 0.89, affirmation 0.88, aid 0.86, total function 0.90, and total network 0.92. Two of the subscales, affect and affirmation, were in the revised version made a single subscale, emotional support. The alpha coefficient in the present study, computed to assess the internal consistency of the subscales for this sample, was 0.93.

The Rosenberg Self-Esteem Scale
Global self-esteem reflects several factors such as people's affective states, their specific self-views and the manner in which they frame these self-views. Rosenberg suggested that self-esteem is an attitude that can be measured and has two connotations, either 'very good' or 'good enough'. A global self-esteem scale, like Rosenberg's Self-Esteem Scale, (RSE) is unidimensional and content-free and reflects an evaluative, affective and cognitive, component of self. Rosenberg Self-Esteem Scale (RSE) is a 10-item Guttman scale reported to have good reproducibility, coefficient of 0.92, and scalability but is typically administered using...
a Likert-type response format. This type of scale is seen as a traditional paper and pencil measure of global self-esteem. A four-point scale, from strongly agree to strongly disagree, is used to respond to the items, although they are scored only as agreement or disagreement. Agreement means that the person respects himself, considers himself worthy but not necessarily better than others. On the other hand, disagreement does not mean that the person considers himself worse than others. A person with high self-esteem feels he is a person of worth who respects himself for what he is but does not consider himself superior to others. Low self-esteem implies self-rejection, self-dissatisfaction and self-contempt. A person with low self-esteem wishes his self-picture was otherwise and he lacks respect for the self, which he observes. Items rating were reversed where necessary so that higher scores always indicated lower self-esteem. Possible scores range from 10 to 40.

Researchers using the RSE indicate acceptable to high reliability. For a sample of men 60 years or older the reported coefficient alpha was 0.72 and for a group of college students the alpha was 0.88. The Gray-Little and Williams paper about Rosenberg Self-esteem Scale reported Cronbach’s alpha for the 10-item test as 0.88. Rosenberg reported a test-retest reliability as 0.85. In the present study the coefficient alpha for reliability was 0.74.

Translation of the instruments
Both the RSE and NSSQ were translated into Swedish by the researchers. Prior to use of the instruments a native English speaking professional translator in order to establish equivalence, retranslated the Swedish version to English. This translation was then compared with the original. When words were translated differently, the researchers and the translator discussed them and a translation was agreed upon. This procedure assures that the substance was preserved and is seen as the accepted method for language-validation, often referred to as back-translating, and has been recommended as one of the best translation methods for cross-cultural studies. The translation and back-translation of the NSSQ and the RSE were equivalent to the originals, and no cultural dilemmas could be found by the researchers or the native Englishman.

Data Analysis
Descriptive statistics were used to summarise the demographic variables. For comparison of means of two independent groups, Student’s t test and ANOVA were used. The Pearson’s X2 test for categorical data was used to assess whether there was significant association at the 5% significance level, between each of the measures assessing social support and functional network properties, self-esteem, as well as demographic data. Pearson’s correlation analysis was used for showing correlation between components in the NSSQ and RSE. The statistical analyses were performed using Statistical Package for the Social Sciences (SPSS; Chicago, IL, USA).

RESULTS
The sample of 216 respondents, with 116 (53.7%) females and 100 (46.3%) males, ranged in the age group from 26 to 82, with a mean age of 63.63 and SD 12.52 (median 68.0). The majority of the respondents was married or common law wives/husbands (75.9%) and retired (66.6%). 89% of the respondents had children and about 64% had grandchildren. The average duration of illness was 5 years for the sample (n=216). Sample characteristics with reference for cancer diagnosis and treatment is shown in Table 2.

Table 2: The characteristics of the sample (n=216) with respect to cancer diagnosis and treatment.

<table>
<thead>
<tr>
<th>Cancer diagnosis</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>106</td>
<td>49.1</td>
</tr>
<tr>
<td>Uterus cancer</td>
<td>8</td>
<td>3.7</td>
</tr>
<tr>
<td>Breast and Uterus cancer</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>91</td>
<td>42.1</td>
</tr>
<tr>
<td>Testis cancer</td>
<td>9</td>
<td>4.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment</td>
<td>19</td>
<td>8.8</td>
</tr>
<tr>
<td>Surgery</td>
<td>53</td>
<td>24.5</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>5</td>
<td>2.3</td>
</tr>
<tr>
<td>Radiation</td>
<td>23</td>
<td>10.7</td>
</tr>
<tr>
<td>Combination treatment</td>
<td>104</td>
<td>48.1</td>
</tr>
<tr>
<td>Hormone therapy</td>
<td>12</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*Combination = surgery + radiation +/or chemotherapy

Social support
The respondents listed a total of 1711 persons in their networks. The mean number of persons in each network was about 8.0. The size of the networks ranged from 1 member to 20 members. Relatives (spouses and family) and friends were listed most frequently, 59% and 23%, respectively. The respondents reported an average of about four family members and about two friends in their social support network (Table 3). The relationships reported lasted from less than 6 months (0.3%) to more than 5 years (93.9%). Health care providers were only listed 3.5% followed by minister/priest listed 1.1%.

An additional finding was that 23.6% of the respondents had lost an important relationship/person in the previous year, and this relationship/person was estimated as

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Carina Bertolo

supportive to 'a great deal' by 13.4% of those respondents who had lost an important relationship/person.

Table 3. Social support personal network listed by the respondents (n=216).

<table>
<thead>
<tr>
<th>Source of support</th>
<th>No. network</th>
<th>Percent of total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse/partner</td>
<td>173</td>
<td>10.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Family</td>
<td>836</td>
<td>48.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Friends</td>
<td>389</td>
<td>22.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Workmates a</td>
<td>128</td>
<td>7.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Neighbours a</td>
<td>83</td>
<td>4.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Health care provider b</td>
<td>60</td>
<td>3.5</td>
<td>0.3</td>
</tr>
<tr>
<td>Counsellor b</td>
<td>5</td>
<td>0.3</td>
<td>0.02</td>
</tr>
<tr>
<td>Minister/Priest b</td>
<td>19</td>
<td>1.1</td>
<td>0.09</td>
</tr>
<tr>
<td>Others c</td>
<td>18</td>
<td>1.0</td>
<td>0.08</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1711</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

a could also be called non-professionals
b could also be called professionals
c "Other" responses included member of different categories, for example: landlady; domestic animal, e.g. the dog, the cat.

Self-esteem

Only 29% of the respondents in the present study had low self-esteem and 71% had high self-esteem. The distribution of self-esteem between female and male were, 73% of the females and 69% of the males had high self-esteem and 27% of the females and 31% of the males had low self-esteem.

Chi-square test did not show any statistical significance with respect to self-esteem and cancer diagnosis or treatment received. Self-esteem and age showed a statistical significance (p = < 0.05), since respondents aged between 26-63 more often scored high self-esteem than low self-esteem. There was a trend towards significant difference concerning self-esteem and employment (p = 0.05). A statistically significant difference was shown with respect to self-esteem and marital status (p = < 0.05), e.g. being single, more often resulted in high self-esteem.

Table 4. NSSQ variables of a sample of adults afflicted with cancer related to reproductive organs, including breast cancer.

<table>
<thead>
<tr>
<th>NSSQ variables</th>
<th>(n=216)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network size</td>
<td></td>
<td>8.04</td>
<td>4.42</td>
</tr>
<tr>
<td>Emotional support</td>
<td></td>
<td>100.37</td>
<td>59.39</td>
</tr>
<tr>
<td>Aid</td>
<td></td>
<td>52.46</td>
<td>32.33</td>
</tr>
<tr>
<td>Total function</td>
<td></td>
<td>152.53</td>
<td>88.33</td>
</tr>
<tr>
<td>Total network</td>
<td></td>
<td>76.79</td>
<td>42.01</td>
</tr>
<tr>
<td>Percent experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss</td>
<td></td>
<td>23.60%</td>
<td></td>
</tr>
</tbody>
</table>

Social support and self-esteem

Chi-square test did not show any statistical significance with respect to self-esteem and NSSQ three subscales of social support (affect, affirmation, aid), functional network properties (number, duration and frequency) and recent loss of network members.

With the exception of the total loss correlation, there were moderate correlations between self-esteem and all the subscales of social support (r=.24) Of the social support subscales, emotional support was most strongly correlated with self-esteem (r = .27) followed by total function (r = .26).

Table 5. Pearson Correlation between Self-Esteem and Social Support (n = 216)

<table>
<thead>
<tr>
<th>Sub-scales</th>
<th>Self-esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional support</td>
<td>-.272 **</td>
</tr>
<tr>
<td>Aid</td>
<td>-.228 **</td>
</tr>
<tr>
<td>Total function</td>
<td>-.261 **</td>
</tr>
<tr>
<td>Total network</td>
<td>-.240 **</td>
</tr>
<tr>
<td>Duration</td>
<td>-.330 **</td>
</tr>
<tr>
<td>Frequency of contact</td>
<td>-.251 **</td>
</tr>
<tr>
<td>Total loss</td>
<td>-.005</td>
</tr>
</tbody>
</table>

** Significant at .01 level

DISCUSSION

It is common that research is conducted with different instruments, even if weaknesses and limitations could be found. The researcher has the responsibility to analyze and discuss the weaknesses and limitations discovered. In this paper the authors have had the ambition to take these aspects into consideration.

The network size was small, with a mean of eight persons, which is less than reported in other studies.20,41,23 Kesselring et al.,23 show in their study that patients with small networks would require more support from the health care system, which is not consistent with the findings in the present study with respect to that health care providers only are reported at 3.5% and reached only sixth place in the social support personal network. The respondents reported nearly 60% of their network as relatives (spouse and family), which is outstanding and in accordance with what Peltonen24 refers to as the primary level of social support. These findings are also consistent with the studies about Swiss, Egyptian, and Taiwanese cancer patients.20,41,23

Friends were reported in the social support network at a frequency of about 23%, and together with the figure from relatives the sum is about 83%, which highlights that emotional support as well as tangible support from these kinds of sources are perceived as the most helpful. This is in conformity with the findings by Dakof and Taylor45 which shows that support was dependent on the source. The most
helpful type of emotional support received was from spouse, family and friends. Also informal and tangible support was the most helpful type of support provided by these sources.

Even if the source of social support may vary and the meaning, nature and measurement of social support is debated in the literature, it is claimed to have positive effects on a variety of outcomes, including health and well-being.27

Adequate social support can protect people in crisis from a wide variety of pathological states as well as reducing the amount of medication required. It also influences the recovery in a positive way.17,56

Cancer patients may experience changes both psychological and physical and the patients' self-esteem may be affected.13,14,15 In the present study chi-square test did not show any statistical significance with respect to self-esteem and cancer diagnosis or treatment received. Psychological distress is regarding to Rosenberg59 associated with low self-esteem. Munstedt et al.,11 found that cancer patients receiving chemotherapy felt less self confident and Lewis et al.,53 found that cancer patients undergoing surgical treatment had lowest self-esteem eight weeks after the diagnosis, furthermore Frank-Stromberg54 showed that self-esteem was decreased by 18 % of the patients. In the present study, 29 % of the respondents scored low self-esteem, but since this is not related to cancer diagnosis and treatment there must be other affecting factors. Being in the age group 26 to 63 and still being employee seems to be a significant factor for high self-esteem. This could be a cultural aspect, since in Sweden employment gives the person a degree of worth and value as a human being in the world. In Sweden, people generally are employees till the age of about 65, which could explain the fact that high self-esteem is related to the age group presented. It is notable that being employed seems to have an impact on self-esteem, though work mates were listed by the respondents only to the level of 7.5 % of the total network. Once again, it seems to be a cultural aspect that a work mate is not seen as a friend, since being a friend in Sweden demands that the person has to been known for a long time and an intimacy and confidence should be built up.

A statistically significant difference was shown with respect to self-esteem and marital status, e.g. being single, more often resulted in high self-esteem. The reason for this could only be speculated about. Since their network size is similar to the married respondents, the singles network may consist of another variety of sources. Lutgon62 means that neighbours are better sources of support for time-urgent tasks while friends are most useful for emotional support. Could it be so that singles perceive social support from various sources (other than the relatives), which enhance their self-esteem.

Chi-square test did not show any statistical significance with respect to self-esteem and social support. Thus, emotional support was moderately correlated with self-esteem, which is in accordance with the studies by Wortman and Conway16 and Aymanns et al.,17. This could be due to the fact that relatives and friends were most frequently reported as sources of social support, and this relation (relatives/friends) and emotional support is confirmed by the findings in Lutgon study.62 It also seems quite logical that emotional support has an impact on self-esteem, since the items in emotional support are referring to being loved, human value and respect, which are closely linked to self-esteem.

This paper has focused on social support and self-esteem in patients afflicted with cancer. It is notable that the mean age of the sample was 63.63 and the average duration of illness was 5 years. These factors, depending on age and experiences may influence how the respondents listed and scored their network and self-esteem. There is a need for research in this area, i.e., the relationship between cancer, self-esteem and the need of social support. Since previous studies often have a short-term perspective, further research are supposed to focus on cancer patients on a long-term period after surgery and treatment. Cancer patients are in most counties focused on in their phase of diagnosis and treatment, but the interest in them decreases, both from the health care system and the society, as time goes by. Increased knowledge about these patients' long-term experiences may affect and change attitudes on cancer patients and change reception with respect to that cancer is a chronic disease, which affects not only the patient but also the family.

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Lung Segmentation: Applications in Chest Radiology

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ABSTRACT

Computer-aided diagnostic schemes are being developed to assist radiologists in their medical decision-making tasks. Researchers at The University of Chicago are developing computerized techniques to evaluate chest radiographs and mammograms for potential abnormalities, including cancer. Automated segmentation of the lung fields usually initiates advanced schemes designed to detect pathology in chest radiographs. Details of one such segmentation scheme and its direct application to quantitative image analysis are discussed along with measures of the accuracy of the resulting lung segmentation contours. Lung segmentation in computed tomography (CT) scans is addressed as an initial step towards the automated three-dimensional detection of lung nodules.

INTRODUCTION

Radiology is an intrinsically visual discipline. Through years of training and experience, radiologists are able to recognize the sometimes-subtle radiographic shadows produced by pathologic processes and anatomic anomalies. Ever since x-rays were first turned on the human body to generate medical images shortly after Wilhelm Roentgen's 1895 discovery, radiologists have made their diagnostic evaluations based on film interpretation. Although the intervening century has seen vast changes in x-ray generators and screen-film systems, film has been a constant in the process throughout.

Radiology, however, has not been spared from the infiltration of computers into science and society. On the contrary, the very nature of the radiologic process, from the technical, image acquisition aspect to the clinical, diagnostic evaluation aspect, makes it uniquely amenable to the logic utilized by computers. The continuously evolving union of diagnostic radiology with image processing, computer vision, artificial intelligence, and computer-aided diagnostic systems presents vast opportunities for research with the intent of eventual clinical implementation. The all-digital radiology department, once a vague futuristic notion, has become a reality and is slowly gaining acceptance around the world.

Key words: computer-aided diagnosis, image processing, computed tomography, nodule detection, thoracic imaging.

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