PSYCHOLOGICAL CORRELATES OF CANCER SURVIVAL

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Abstract

For studying the involvement of psychology in physical health it is necessary to define the psychological factors. The purpose of the study was to define psychological variables that support cancer survival. The theoretical approach was based on the cognitive orientation (CO) health model (Kreitler & Kreitler) The methodology of identifying the relevant psychological factors is based on interviewing pretest subjects according to systematic specific guidelines that enable defining themes summarized in the form of a questionnaire. The questionnaire of the CO of survival included statements referring to beliefs about oneself, norms, goals and general. The themes were identified in a separate preliminary study in which recurrence was retrospective. In the major study the CO questionnaire was administered to cancer patients with three different diagnoses (breast, melanoma, colorectal) in the first phase of their medical treatment and they were checked again after 5 years and then again after 12 years. The dependent variables were no recurrence or recurrnce (metastases, mortality). The correct identification of the no recurrence patients was by discriminant analysis significant for all groups and all patients after 5 years, and for breast cancer and all patients after 12 years.The results support the role of CO as the basis for identifying the relevant psychological correlates of survival in cancer.

Keywords: Cognitive orientation, survival, breast cancer, melanoma, colorectal cancer.

1. Introduction

Since antiquity in many cultures people believed that psychological factors were involved in affecting physical health and could be used for maintaining or enhancing it. According to the "old" or original version of psychosomatic model, the occurrence of disease depended on the activity of a physical factor, such as a microbe or virus, or a psychological problem, which in the framework of psychoanalytic approach had usually to do with sexuality or aggression. Many studies were carried out with this model, mainly in regard to diseases, such as asthma and gastrological disorders (Engel, 1962). However, in a fairly large body of studies no differences were found between diseases supposedly caused by physiological factors or by psychological factors. Further, physiological treatments were helpful in diseases supposedly caused by psychological factors while psychological interventions were helpful in diseases supposedly caused by psychological factors. Moreover, many of the findings of studies about the psychological impact on health are controversial and not reproducible, not in the least because they have not considered at all or not sufficiently the involved medical variables (Kreitler, 2019).

Insofar as the psychological variables used in these studies are concerned, their major shortcomings are the following:

(a) The assessed psychological variables are not disease specific, i.e., they are mostly the same for many different diseases, viz. anxiety, depression and stress. Hence, their use provides little information about the characteristic features of the specific examined disorder;

(b) The assessed psychological variables are not grounded theoretically. This indicates that the psychological variables have not been selected in a systematic manner or considering the content or nature of the disorder.

(c) The relation of the assessed psychological variables to the disease is unspecified, so that they could be its correlates or antecedents or its results, or even any two or three of these.

One result of the unclarity of the impact of psychological factors on physical diseases, is that the psychotherapeutic attempts in regard to the disorders were increasingly separated from the psychological and physical background of the disorders and focused instead on different culturally-based natural methods, dependent more on the beliefs and tendencies of the individuals than scientific data.

2. The cognitive orientation model of health wellness

The evident shortcomings of the old psychosomatic approach to studying the impact of psychological factors on physical health underscored the need to develop another approach that would clarify the role of psychological factors in regard to the occurrence of disease and recovery from disease, and will promote the cooperation between medicine and the behavioral approaches in theory and practice.

At the core of the approach is the concept of the pathogen and the risk factors as the causal factors for the occurrence of a disease. The pathogens are biological agents that cause the disease, such as viruses, bacteria, fungi or parasites. A pathogen may also be a psychological issue but this is outside the framework of the current presentation. Risk factors, sometimes called background factors, affect the likelihood that a pathogen will produce the disease. The risk factors are of different kinds. They include for example immunological variables, nutritional factors and other factors. Both the pathogen and the risk factors are specific for the particular disease. When recovery is the issue, treatment and protective factors replace the pathogen and the risk factors, respectively. In some cases, the protective factors are the obverse of the risk factors. The pathogen and the risk factors may be investigated separately, and the investigation may proceed even when the pathogen or some of the risk factors may not be identified. For example, in cardiology the pathogen has not been identified while many of the risk factors have been examined and are being used in treatment, while in regard to the corona, the pathogen has been identified but only few of the risk factors are known.

2.1. Major theses of the cognitive orientation theory

The cognitive orientation (CO) theory The CO theory is designed to enable understanding, predicting and changing behavioral, outputs of different kinds, e.g., behavioral, cognitive, emotional. It deals with identifying and changing the psychological components of the risk factors, relevant for the specific disease.

The major theses of the CO theory are: 1. Cognitive contents and processes affect physiological processes relevant for disease and health; 2. Health-relevant cognitive contents and processes are disease specific; 3. Health-relevant cognitive contents and processes constitute part of the conditions promoting disease or health.

The psychological factors relevant for a specific health state may be represented as a vector grounded in four types of beliefs and defined by themes specific for that disorder. The beliefs are *Beliefs about oneself, Beliefs about others and reality, Beliefs about goals, Beliefs about rules and norms.* The beliefs do not refer directly to thee examined behavior but to themes that represent the underlying meanings ofc that behavior. The themes are identified by a specific systematic interviewing process known as "stepwise guided interviewing" in pretest subjects. In the predictive matrix, the belief types define the columns while the rows are defined by the themes. The four types of beliefs together form the vector used in predicting the output. This vector is called 'the motivational disposition" and it is not conscious, not controlled by volition, and not based on decision making or on considerations of costs and benefits (Kreitler, 1925; Kreitler, Chaitchik, Shaked, & Shaked, 1997; Kreitler & Kreitler, 1976).

2.2. Identifying and testing the themes in a preliminary study

The themes of survival were first identified by the stepwise guided interviewing procedure which consists in interviewing individuals some with no disease recurrence and some with disease recurrence after at least three years post diagnosis. The subjects are first asked about the general conventional meaning of survival, and then about the subjective personal meaning of selected parts of their previous response. This procedure is repeated two more times. Themes are identified by independent judges as the contents that appears at the end of the third step, in at least 50% of the subjects without recurrence and in no more than 30% of those with recurrence.

The list of themes of survival was the following: Being involved; Readiness to make efforts; Readiness for changes in life; Focusing on the most relevant; Readiness for getting help from others; Expressing emotions outwardly; Accepting limitations; Sharing experiences with others; Not emphasizing achievements; Not emphasizing cleanliness, order and punctuality; Accepting relativity in regard to truth; Not seeking rewards for everything one does; Not striving for perfection; Nothing must happen exactly as expected or desired; Uphold routine as much a possible; Believe in something – religion, ideal etc.

The themes were used for constructing a CO questionnaire of survival. The themes were first factor analyzed and the major themes were used as the contents of the beliefs in the CO questionnaire (e.g., sharing experiences, accepting limitations, search for meaningfulness, being involved). The questionnaire was validated in a study with patients on the basis of retrospective information.

The participants were breast cancer patients (n=65, all female, mean age 55.3, stages I, IIA, IIB), melanoma patients (n=39, 19 females, 20 males, mean age 49.2, stages IA, IB, IIA, IIB); patients with

colorectal cancer (n=40, 15 female, 25 men, mean age 65.3, stages IA, IB, II). After 5 years the recurrence in breast cancer was in 19 patients (29.2%), in 19 melanoma patients (48.7%) and in 17 colorectal cancer patients (42.5%).

The means of the scores of the forebelief type were compared between those who had no recurrence and those who had a recurrence. The means were 72.3 versus 54.1 (p<.01), 69.5 versus 43.7 (p<.01), 62.4 versus 51.9 (p<.05), and 65.7 versus 49.8 (p<.05) for beliefs about self, norms, goals and general, respectively. In all four belief types the means of those with recurrence were higher than those without recurrence. These findings provide validation to the CO questionnaire of survival.

3. Prospective CO study of survival

3.1. Objective
The purpose was to test prospectively the validity of the CO questionnaire of survival in a sample of different cancer patients.

3.2. Method
The participants were cancer patients with different diagnoses: 80 patients with breast cancer (all females, mean age 52.1, stages I, IIa, IIb); 44 patients with melanoma (15 females & 29 males, mean age 47.5, stages Ia, Ib, IIa, IIb); 42 patients with colorectal cancer (19 females, 23 males, 62.4 mean age, stages Ia, Ib, II). The three groups of patients were selected for the study because their diagnoses referred to different kinds of cancer in terms of the involved pathology, required treatments, course of disease and chances of recovery.

3.3. Procedure
The participants were recruited in the oncology department of a major hospital in Israel. They were administered the CO questionnaire of survival and a brief demographic questionnaire referring to gender, age, family status, educational level, and profession. All participants signed the informed consent form. The CO questionnaire included beliefs of four types (about self, norms, goals and general) in the form of statements representing factors based on the 16 themes. The questionnaires were administered when the patients were first contacted, 1-5 months after their initial diagnosis. All patients underwent the prescribed treatment for the disorder.

The independent variables were the scores of the four belief types that the patients got after responding to the CO questionnaire of survival. The dependent variables were 'no recurrence' of the disease or recurrence of the disease (metastases, another cancer or mortality). The dependent variables were examined twice: 5 years after the initial diagnosis, and 12 years after the initial diagnosis. The hypothesis was that the scores of the CO questionnaire of survival will enable predicting who of the patients will have a recurrence of the disease after 5 and/or 12 years. On the basis of previous findings, the expectation was that the correct prediction will be based on all four belief types or at least three (Kreitler, 2025; Kreitler & Inbar, 2000; Kreitler & Kreitler, 2009).

3.4. Results

Table 1. Predicting no recurrence in three diagnostic groups of cancer patients
on the basis of the scores of the CO questionnaire of survival.

Diagnostic group	No recurrence	Recurrence	Mortality	Predicting recurrence by stepwise discriminant analysis (List of the predictors, correct classification by CO variables)
After 5 years				
Breast cancer	55	16	9	Self, goals, norms, general 78.l8% CR=4.76, p<.001 z=3.171, p=.0015
Melanoma	31	7	6	Goals, self, general, norms 74.19%, CR=3.69, p<.01 z=2.086, p-=037
Colorectal cancer	12	20	10	Norms, general, self 75.00%, CR=3.43, p<.01 z=1.789, p=0.736
All subjects together				Self, norms, goals, general 75 from 98, 76.53%, CR=3.79, p<.01 z=3.852, p=.0002

After 12 years				
Breast cancer	54	18	8	Self, goals, general 74.07%, CR =4.51, p<.001 z=2.578, p=.0099
Melanoma	25	8	11	Self, goals, general 72%, CR=3.12, p<.01 z=1.732, p=0833
Colorectal cancer	8	22	12	Norms, self, general 62.5% CR=3.00, p<.05 z=0.713, p=.4758
All subjects together				Goals, self, norms, general 63 of 87, 72.41%, CR= z=3.107. p=.00019

Note. In the last column, the first row presents the belief types that have a significant contribution to the prediction, listed in the order of their contributions. The second row presents the percentage of correct classification according to the discriminant stepwise analysis, and the significance of this percentage as assessed in terms of the Critical Ratio (CR). The third row presents a different assessment of the significance of the classification into those who have been correctly identified as with recurrence compared to the number of correctly classified patients on the basis of a randomly expected correct classification of 50%.

4. Discussion

The results presented in Table 1 show that after 5 years there were 98 patients without recurrence (59.03% of the original number of 166), while after 12 years the number was 87(=52.41% of the original 166). The difference is expected but not too big. However, there were significant differences in the no recurrence percentages for the three groups. After 5 years the percentages were 68.75%, 70.45% and 28.57% for the groups of breast, melanoma and colorectal cancer; after 12 years the percentages were 67.5%, 56.87% and 19.09% respectively. It is evident that no recurrence was lowest in the colorectal cancer group.

The percentages of correct classification by the CO scores into patients without recurrence and those with recurrence (recurrence plus morality) were after 5 years 76.36% for breast cancer, 74.19% for melanoma, an 75% for colorectal cancer. For all subjects together the percentage of correct classification after 5 years was 75.53% (75 from 98). After 12 years the percentages were 74.07% for breast cancer, 72% for melanoma cancer, 62.5% for colorectal cancer, and 72.41% (63 of 78) for all patients together

The findings show that the identification of the subjects who had no recurrence by means of the CO questionnaire was significant for each of the diagnostic groups and for all patients together after 5 years. After 12 years it was significant for breast cancer and for all subjects together, but not for the groups with melanoma and for those with colorectal cancer. The results support the hypothesis in regard to all predictions on the basis of CO scores after 5 years, and in regard to breast cancer and all subjects after 12 years too.

In all cases, all four belief types or a least three had a significant contribution to the prediction. This finding corresponds to the hypothesized prediction. Of the eight cases of prediction, self and goal beliefs were in the first places. Notably, these belief types are those that represent the personal involvement of the subjects more than the more formal belief types that refer to norms and general beliefs about others and reality.

5. Conclusions

Cognitive Orientation variables, representing beliefs referring to specific themes, in terms of four belief types, enable predicting no disease recurrence in cancer patients of stages I and II over a period of 5 years and 12 years follow-up.

The CO themes are disease specific and differ mostly from those often identified as those that are psychologically involved in cancer disease, viz. anxiety, depression and stress.

The findings provide the basis for conducting studies of psychological interventions focusing on the identified beliefs and themes designed to affect favorably disease course in cancer patients

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