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School-based prevention of depressive symptoms in adolescents : a 6-month follow-up.

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School-based Prevention of Depressive Symptoms in Adolescents:

A 6-Month Follow-up

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Abstract

Objective: Depressive disorders in adolescents are a widespread problem with extensive psychosocial consequences. We designed a school-based program to prevent the increase of depressive symptoms. We expect the program to reduce dysfunctional automatic thoughts and improve social skills and thus prevent the increase of depressive symptoms.

Method: The design includes a training group and a non-treatment control group with pre- and post-measurement and 3- and 6-month follow-ups. We followed 324 eighth graders in both groups. School classes were randomly assigned to one of the two groups. The prevention program, LISA-T, is based on cognitive-behavioral therapy concepts and targets of cognitive and social aspects. It comprises 10 meetings of 1.5 hours in a regular school setting.

Results: Increases of depressive symptoms in non-depressed adolescents in the training group were prevented over a 6-month period. Furthermore, adolescents with subsyndromal depression in the training group reported fewer symptoms, whereas depressive symptoms within the control group did not change. However, the groups did not differ with regard to social skills, frequency of negative automatic thoughts, and depressive symptoms before the prevention program.

Conclusions: LISA-T is an effective school-based prevention program for eighth graders with minimal to mild depressive symptoms, but further research is needed.

Keywords: school-based prevention, depression, adolescence

Introduction

Depressive disorders in adolescents are a widespread problem. A multitude of studies reports lifetime prevalences of 15 – 20% to majority (Birmaher et al., 1996). Consequences of early-developed depressive disorders may seem to persist until years after adolescence. Depressive symptoms at a young age also increase the probability of depression (e.g., Weissman, et al., 1999) and other psychopathologies later in life (Birmaher et al., 1996). Even so-called "subsyndromal depression" is a serious risk factor for depressive episodes in youth or later in life (Lewinsohn et al., 2000).

Depression: Prevention and Therapy

Following Clarke et al. (1995, 1999), the most effective therapy of clinical depression in children and adolescents and prevention for high-risk groups is cognitive-behavioral treatment. In their meta analysis, Durlak and Wells (1997) found effect sizes twice as high for behavioral and cognitive-behavioral programs (ES = 0.49) than for other intervention approaches (ES = 0.25). Studies for selective prevention programs (i.e., which target individuals whose risk of developing depression is significantly higher than average generally face recruitment difficulties as well as high drop-out rates (Clarke et al., 1993). For example, Gillham et al. (1995) reported an initial recruitment rate between 13% and 19% and an attrition rate of 30% in the evaluation study of their selective prevention program. Shochet et al. (2001) argue that being selected for participation in a selective prevention program might lead to stigmatization for adolescents. Shochet et al. (2001) argue that this is the main reason for recruitment difficulties and high drop-out rates. Therefore, Shochet et al. (2001) prefer universally applied programs which include all students independent of individual's actual risk for depressive disorders. They recommend establishing the program within the context of regular school classes.

Evaluations of available universal prevention programs for depression in adolescence have shown inconsistent effects: Clarke et al. (1993) have been unable to show positive effects with their program. Shochet et al. (2001), however, reported significant positive effects on students' depression within the post-intervention period as well as at a 10-month follow up. This study excluded clinically depressed students, and the authors failed to control for inter-correlations between students in the same class (Hopkins, 1982). This might lead to misinterpretations of the empirical results due to the reciprocal influence and alignment between the individual and his/her group, and the resulting enlargement of differences between groups (Goldstein, 1995). In addition, the authors did not adequately adjust alpha in the post hoc test, possibly causing overestimated effects.

Methodological factors may influence the finding that universal prevention programs are less robust in decreasing depressive symptoms compared to selective prevention programs. A floor effect in the less disturbed universal sample may result in smaller change in symptoms. Universal prevention programs may produce a "sleeper effect" because the majority of participants are not depressed at the time of the intervention but due to the intervention may be protected from depression at some point in the future. Instead, the program will result, in the long run, in lower rates of depressive symptoms when compared to a non-treatment control group. For example, Seligman and colleagues (Gillham et al., 1995) studied selective depression prevention programs and found significant differences between trained students and the control group only after 18 months with more symptoms in the control groups.

Although universal interventions may have difficulty showing significant outcomes, short term participants may be subgrouped to determine important effects. Analytic strategies for evaluating subjects could be: (a) one or minimal symptoms of depression (no depressive disorder), (b) several depressive symptoms (subsyndromal depressive disorder or

less than five DSM-IV major depressive symptoms), and (c) clinically relevant depressive symptoms (depressive disorder). Epidemiological surveys of depressive symptoms suggest this tripartition. In Harrington and Clark's (1998) sample of 11- to 15-year-old adolescents, 40% did not show any depressive symptoms, while 10% fulfilled requirements for the diagnosis of major depression according to DSM-IV, and 50% had subsyndromal depression.

Using the social information processing model of social competence described by Dodge (1993) as background, we developed the universal school-based prevention program LISA-T (Pössel et al., 2004) to prevent the increase of depressive symptoms. Methods used are taken from cognitive-behavioral therapy. According to Dodge's (1993) model, behavior is the consequence of an information processing sequence in reaction to situational stimuli. Malfunction of one or more information processing stages can result in dysfunctional interpretations of situational stimuli and withdrawal from social situations. The model has found empirical support by a multitude of studies (e.g., Quiggle et al., 1992). Based on this model, our prevention program has cognitive and social objectives. We try to (a) illustrate the relationship between cognition, emotion, and behavior, (b) explore and change dysfunctional cognitions, (c) train self-assured behavior, (d) train social competence skills. According to this, the prevention program LISA-T (Pössel et al., 2004) should affect depressive symptoms (distal objective) on two routes. First, its cognitive modules should enable students to reflect and question automatic thoughts (Beck et al., 1979) and deliberately develop more functional thoughts. Second, its social module should facilitate adaptive social behavior by teaching students social competence strategies and by practicing existing skills. Adaptive social behavior enables students to develop their individual social network, to enlarge it, and to improve its use (proximal objectives).

Hypotheses

In addition to the analysis of depressive symptoms, we studied factors associated with the development of depressive disorders, such as automatic thoughts and social resources (Barrera and Garrison-Jones, 1992).

We expect differential effects for subgroups depending on the magnitude of depressive symptoms: In particular, students without depressive symptoms and students with subsyndromal depressive symptoms should benefit strongly from the prevention program. They will show less dysfunctional (i.e., unrealistic, self devaluating) automatic thoughts and increased social skills. Due to improved social skills, students will enlarge their social network and use it more. Participants without depressive symptoms will show no increase in depressive symptoms between the times of measurement, whereas adolescents with subsyndromal depressive symptoms should show a decrease in depressive symptoms after participating in the prevention program. Students with clinical depression will probably not show any effects on proximal nor distal objectives because this subgroup would need more intensive assistance than can be offered within this program's framework in order to benefit.

Methods

Participants

Letters were sent to the principals of all middle schools in the area of Tuebingen (Germany), asking for their school's participation in this project. Next, consent forms were sent to the parents of the eighth graders at the six participating schools. Parents were informed that within each school the classes were randomly assigned to the training and control group. We tried to recruit both the training and the control group in each school; however, there was one school with only one class, which we assigned to the training group. In another school with three classes, we randomly assigned two classes to the training group.

Separation of each school's classes with regard to certain conditions was necessary in order to increase statistical power with constant sample sizes: variances between schools are often four times the size of variances between classes of the same school (Brown and Liao, 1999). Therefore, within the schools, classes were assigned to either a training group or a control group. Also, this way there was no need to consider the school as a group factor in the statistical analysis.

As a result of the randomization procedure, 200 students (87 girls) in seven classes received the prevention program, and 147 students (79 girls) in five classes received usual lessons. The mean age of the students in the training group was 13.82 (SD .71). In the control condition the mean age was 14.18 (SD .78). For five students (1.44%), no parental consent was given. As we used hierarchical linear models, individual data were included as long as students did not miss more than two dates of measurement. A total of 18 students (5.19%) only participated at one meeting, e.g. due to changing schools. Thus, 324 students (93.37%) of the original sample provided utilizable data.

Measures

Distal Objective

Radloff (1977) developed the Center for Epidemiological Studies – Depression Scale (CES – D) as a quickly to administer, economic screening instrument able to measure current depressive symptoms. The CES-D has been repeatedly applied to adolescents (e.g., Roberts et al., 1990). For German-speaking samples, standard scores for this age group are available (Meyer and Hautzinger, 2001). The CES-D consists of 20 items (e.g., "During the past week, there were things that upset me that usually do not upset me."). On a four-point scale ranging from 0 to 3, frequency of symptoms is rated, with higher numbers indicating higher frequency of occurrence. Item scores are summed, creating a range from 0 to 60.

According to epidemiological data, a total of 10% of students have clinically relevant symptoms of depression and 50% show subsyndromal depression (Harrington and Clark, 1998). According to a CES-D sum calculated in a standardization study by Meyer and Hautzinger (2001), all girls with CES-D value of ≥ 31 are considered "clinically relevant". Girls scoring from 14 to 30 are assigned to the subsyndromally depressive group, those scoring < 14 to the no-symptoms group. For boys, cut-off for the assignment to "clinically relevant" is ≥ 23. Boys are considered subsyndromally depressed with a CES-D value of 11 to 22, and symptom-free when scoring < 11. Internal consistency within the German standardization sample is $\alpha = .85$ (Cronbach's Alpha; Meyer and Hautzinger, 2001).

Proximale objectives

The Automatic Thought Questionnaire (ATQ; Hollon & Kendall, 1980) measures dysfunctional thoughts. The ATQ was originally developed for adults, but also proved successful with adolescents of 12 years and older (e.g., Garber et al., 1993). Among adolescents and adults the ATQ scores vary depending on severity of depression, but not for age (Graber et al., 1993). The ATQ consists of 30 items (e.g., "Nobody understands me!") ranging from 1 to 5, with 5 indicating the most frequent occurrence of dysfunctional thoughts. The total sum score of all item values ranged from 30 to 150, with an internal consistency (Cronbach's Alpha) of $\alpha = .90$ (Hollon and Kendall, 1980).

The Questionnaire of Social Support (FESU, Bliesener, 1991) is a self-report measure for various aspects of social support. Each question addresses a certain problem and asks about persons who help and support the adolescent (network size), how often the adolescent asks assistance of each of these persons (frequency), and how content he or she is with each person's support (satisfaction). For example, one of the items asks, "Who do you talk to if

you are dejected?" The FESU comprises six items. The number of persons that can be named in each item is not limited (network size). Students rate frequency between 1 and 5 for each named person, with higher scores indicating higher frequency/satisfaction. Mean scores including all named persons are calculated for each item. Each of the three indices (extent of network, frequency, satisfaction) is averaged over all six items. Internal consistency in the German standardization sample is α = .86 for extent of network, α = .76 for frequency, and α = .83 for satisfaction (Cronbach's Alpha; Bliesener, 1991).

The school-based prevention program: Ease of Handling Social Aspects in Everyday Life-Training (LISA-T)

The cognitive focus of the program is based on Beck's et al. (1979) cognitive therapy approach. First, we explain students the relationship between cognition, emotion, and behavior. Students then acknowledge their own automatic thoughts, confront these thoughts with reality, and finally substitute them by functional, i.e., more realistic and helpful, thoughts.

The social focus is addressed by modules of assertiveness and social competence training. In the assertiveness training, students practice confident, assured behavior in various situations. The social competence training targets at the students' abilities to develop and maintain social contacts and networks. Both are practiced in role plays using exemplary situations brought up by the students.

Design and Procedure of LISA-T

To test the effects of our program, we used a design comprising a training group (LISA-T) and a control group (LISA-C) at four measure times: pre-measurement, post-measurement, 3-month follow-up, 6-month follow-up.

We delivered LISA-T once a week over a 10-week period in the context of regular school lessons. One session took two lessons, i.e., a total of 1.5 hours. During this time the LISA-C classes attended their usual lessons. LISA-T classes were divided into two groups according to sex, because our pilot study has shown more cooperation between students when the sexes were segregated. Thus, groups varied in size from 8 to 24 students.

Each group was coached by a trainer and a co-trainer. Thus, each school class required a total of four trainers. Trainers were either psychologists (M.A. equivalent) or graduate students experienced in working with adolescents. Before the training, each trainer went through the program as a participant. Trainer studied the manual, all materials and procedures, and resolved any unclear points with the first author. During the intervention, all trainers where seen weekly to present video recordings of each sessions. Recordings were also rated by independent clinicians to ensure that trainers adhered to the manual.

Data Analysis

Inter-correlations between students of the same class or school are a general problem in school-based studies (Hopkins, 1982). Disregarding group variables may cause misinterpretations of results because natural groups, such as classes, cause reciprocal influence between individual and group, leading to enhanced group-specific differences between individuals (Goldstein, 1995). Therefore, we used hierarchical linear models for data analyses. The measurement factor was nested within students, who were nested in classes that were randomly assigned to either the training or the control condition. School was not considered a group variable because both experimental conditions were administered to each participating school.

Our dependent variables were the depression scores of the CES-D (distal objective) as well as automatic thoughts (ATQ; proximal objective) and social network (FESU; proximal

objective). The independent variables were time (pre-measurement vs. post-measurement

vs. 3-month follow-up vs. 6-month follow-up); experimental condition (training group vs.

control group); and initial risk status (minimal symptoms vs. subsyndromal depression vs.

clinically relevant depressive symptoms). We formulated hypotheses only for the condition

x measurement interaction and the condition x measurement x risk status interaction. A

posteriori tests were calculated only if these interactions proved significant.

Analyses were carried out using the software package "SPSS for Windows 11". We

calculated mixed models with repeated measures. Significance levels of the a posteriori tests

were Bonferroni adjusted.

Results

No significant differences for experimental condition were found for CES-D scores (18)

(t(252.69) = - 1.52 , p = .130), age (t(314.5) = - 0.59, p = 557), or sex (χ^2 (1) = .56, p = .453)

at pre-measurement. For descriptive statistics of the CES-D, ATQ, and FESU, see Table 1.

Distal Objective

We found significant effects concerning the CES-D symptoms for time (F(3/444.39) =

16.54 , p = .0001) and risk status (F(2/738.21) = 90.96 , p = .0001), as well as for the time x

risk status interaction (F(6/454.43) = 23.82 , p = .0001), the condition x risk status

interaction (F(2/738.21) = 5.07 , p = .017), and the time x condition x risk status interaction

(F(6/454.43) = 2.74 , p = .013). There were no additional main effects or interaction effects

related to CES-D symptoms.

There were no significant differences between training (LISA-T) and control group

(LISA-C) at either of the times of measurement for participants with identical risk status.

Therefore, we conclude that the time x condition x risk status interaction is due to changes

within the conditions of each risk status over all measurements. Accordingly, the interaction

effect is caused by significant differences between pre-measurement and the following

measurements within the respective condition and risk status. Single main effects were

significant for both LISA-T and LISA-C when risk status was "minimal symptoms"; for

LISA-T when risk status was "subsyndromal depression"; and for LISA-C when risk status

was "clinically relevant symptoms".

    In pairwise comparisons, depression scores for risk status "minimal symptoms" in the

condition LISA-C ($\underline{n} = 41$) increased significantly between pre-measurement and all three

following times of measurement. In contrast, no significant changes in depression scores

between the times existed for the condition LISA-T ($\underline{n} = 60$). For risk status "subsyndromal

depression", the effect is due to the decrease of depressive symptoms in the condition LISA-

T ($\underline{n} = 72$) between pre-measurement and 6-month follow-up. No significant changes were

found for the condition LISA-C ($\underline{n} = 55$). For the risk status "clinically relevant symptoms"

in the LISA-C condition ($\underline{n} = 15$) we found significant decreases in depressive symptoms

between pre-measurement and all three following measurements, whereas no significant

changes were observed for LISA-T ($\underline{n} = 9$; see Table 2). Concerning this risk status, we had

to pay regard to the small sample size in LISA-T ($\underline{n} = 9$) and also calculated Wilcoxon

signed ranks tests, leading to results equal to those of the t-tests.

    At each time of measurement we ascertained students' previous assignment to one of the

three risk groups. With this procedure, the number of students with minimal symptoms in

the training group increased from 40.7% (pre-measurement) to 64.3% (6-month follow-up),

whereas the number of students with subsyndromal depression decreased from 52.0% to

31.2%. The number of students with clinically relevant symptoms decreased from 7.3% to

4.5%. However, there was almost no change in the control group over the same period,

(minimal symptoms: 37.2% vs. 37.6%; subsyndromal depression: 50.4% vs. 51.4%;

clinically relevant symptoms. 12.4% vs. 11.0%).

Proximal Objectives

Concerning dysfunctional automatic thoughts as measured by the ATQ, we found

significant main effects for time of measurement ($\underline{F}$(3/393.62) = 23.20 , $\underline{p}$ = .0001) and risk

status ($\underline{F}$(2/806.60) = 72.26 , $\underline{p}$ = .0001). Also, there was a significant interaction effect for

time x risk status ($\underline{F}$(6/393.61) = 8.43 , $\underline{p}$ = .0001). However, we could not find a condition

effect and therefore we did not provide further analyses.

None of the FESU subscales showed significant main or interaction effects.

Discussion

Adolescents who had participated in our prevention program and who reported minimal

initial depression scores did not experience significant increases of their scores during the

following six months. In contrast, adolescents with minimal depression scores who did not

participate in the program showed significantly increased depression scores at all three

following times of measurements. According to our descriptive analysis, the percentage of

adolescents in the training group with minimal symptoms increased during the same period

from 40.7% to 64.3%, whereas percentages in the control group remained stable (37.2% vs.

37.6%). However, there were no significant differences in self-reported depressive

symptoms between training and control group. Thus, LISA-T has a preventive effect on the

development of depressive symptoms in the experimental group with minimal depressive

symptoms.

In addition, depression scores of participating adolescents with subsyndromal depression

were decreasing significantly from pre-measurement to 6-month follow-up. The control

group with subsyndromal depression did not change. During the same period of time, percentage of adolescents in the training group with subsyndromal depression decreased from 52.0% to 31.2%, compared to the control group with 50.4% vs. 51.4%. Our program reduced depressive symptoms and the number of adolescents in this high-risk group. We interpret these results as a possible intervention effect.

Students with clinically relevant symptoms at pre-measurement who did participate in the program showed no change in depressive symptoms. There was, however, a decrease of symptoms at both the 3- and 6-month follow-up when compared to pre-measurement for those adolescents with clinically relevant symptoms who did not participate in the prevention program. Although we did not find differences in self-reported depressive symptoms between training and control group, an iatrogenic effect cannot be excluded. Students with clinically relevant symptoms could have become attentive to their dysfunctional thoughts and low social skills during the prevention program. This might have delayed or even prevented the decrease of symptoms. Our percentage data, however, argue against this effect: the number of adolescents with clinically relevant symptoms decreased in the training group from 7.3% to 4.5%, whereas percentages for the control group during the same period were 12.4% and 11.0%, respectively.

Concerning the distal objective of our program, the prevention of increasing depressive symptoms in adolescents with minimal symptoms, our results look quite promising. LISA-T may be an effective training program for adolescents with non-pathological scores, and for adolescents with an increased risk for depression. Only adolescents with clinically relevant depressive symptoms showed a more favorable decline of symptoms in the control group than in the training group. We expected that participants with clinically relevant depression benefit less from our program than other group. Specificity and intensity of treatment

necessary for severe depressed subjects cannot be provided by a prevention program (e.g., group sizes of up to 24 students).

However, we expected further increases in depressive symptoms in the control group because the majority of epidemiological studies suggest this development (Compas et al., 1997). Instead, we observed a significant decrease of symptoms (pre-measurement: 34.93; 6-month follow-up: 20.00). A possible explanation for the decline of symptoms is the regression to the mean; as students with clinically relevant symptoms had extremely high depression scores, regression to the mean in subsequent measurements is very likely. Extreme scores can be expected to be lower on second measurement. Although depressive symptoms were considerably reduced in the training group (pre-measurement: 33.85; 6-month follow-up: 23.60), this change did not reach statistical significance. This might be due to the small group size: power might have been insufficient for significance. We did not find improvement for dysfunctional automatic thoughts or for social networks due to our prevention program. Thus, we failed our proximal objective. Despite the effects on depressive symptoms, we could not find significant differences in proximal objectives between training group and control group. This finding, however, is in line with results of previous prevention studies. For example, Seligman and colleagues (Gillham et al., 1995) did not find changes in adolescents' attributional styles until the 12-month follow-up past prevention program (Gillham et al., 1995). Such a delay of significant effects in cognitive variables can be explained be the necessity to practice and to use the newly learned techniques in everyday live. Only then differences in automatic thoughts and social support can be found. Lack of significant effects could also be caused by the applied measures. Both questionnaires do not measure underlying vulnerability but correlates of depression and, therefore, might not be sensible to the achievement of the proximal objectives. However, the ATQ assesses dysfunctional automatic thoughts, which have been shown to be

highly correlated with depressive symptoms (Hollon & Kendall, 1980). Therefore, we expected a considerable decrease in dysfunctional automatic thoughts due to the decrease in depressive symptoms, which was not the case. The question remains why the program had positive effects on depressive symptoms. We speculate that the positive results could be due to unspecific effects, such as attention provided by the trainers. Clearly, a replication of this study is necessary. We recommend including an analysis of Dodge's (1993) postulated stages of information processing and an unspecific intervention group. This could provide a more thorough insight into the effectiveness of the prevention program.

<div align="center">Limitations</div>

A major limitation with regard to our data is the sole use of students' self-reports. We did not compare this data with reports of parents, teachers, or peers, and we also failed to use clinical diagnoses or behavioral observation. However, previous studies (for an overview see Kazdin, 1994) have shown a moderate correlation between self-reports and reports from others and could demonstrate that adolescents are a reliable source of information. This is particularly true for internalizing disorders such as depression. Moreover, possible effects of diagnoses as an additional benefit of prevention programs remain unclear. Also, studies on students' behavior have shown that self-reports are indeed valid measures (e.g., Hops et al., 1997).

Our results allow only conclusions about changes in depressive symptoms, but not about the prevention of a depressive disorder. Also, multiple self-reports might have increased the reliability of our results. Both limitations should be considered when replicating our study.

Clinical Implications

Our study considered adolescents with an initial risk status of minimal symptoms as well as adolescents with subsyndromal depression. LISA-T had positive effects even so we could not show differences between training and control group. However, no conclusions can be drawn about the use of LISA-T not only as a universal, but also as a selective prevention program. Possibly, the positive effects found for the risk population are due to this very inclusion of adolescents with non-pathological scores, as discussed by Harrington and Clark (1998) and Shochet et al. (2001). We recommend refraining from including adolescents with clinically relevant symptoms in the training until the causes and mechanism of negative training effects are understood.

We conclude from our evaluation of the prevention program LISA that increases in depressive symptoms in adolescents with minimal symptoms can be prevented for a 6-month follow-up period. More research is needed to gain greater insight into the causal mechanism of the program, and to explain our failure to find significant positive effects on adolescents who were initially diagnosed with clinically relevant depressive symptoms. Future research should focus on the effects that LISA-T might exerts on each specific information processing stage, following the social information processing model of social competence proposed by Dodge (1993). This procedure will clarify if the program has indeed no effect on students with clinically relevant depressive symptoms and, if so, what reasons there are.

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Table 1:

Descriptive statistics of the CES-D, ATQ, and FESU, separated according to time of

measurement and group.

	training group				control group			
	T1	T2	T3	T4	T1	T2	T3	T4
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
minimal symptoms								
CES-D	8.54	10.33	11.59	10.59	8.76	13.85	13.13	14.29
	(2.87)	(5.74)	(7.59)	(8.19)	(3.01)	(8.30)	(7.55)	(8.48)
ATQ	42.38	42.07	41.77	39.61	43.10	39.66	42.68	46.56
	(13.86)	(15.57)	(13.97)	(11.37)	(8.68)	(9.20)	(10.74)	(17.91)
FESU-N	2.20	2.30	2.27	2.34	2.41	2.37	2.23	2.29
	(1.00)	(1.13)	(1.29)	(1.66)	(1.02)	(1.08)	(.90)	(1.13)
FESU-F	3.23	3.60	3.23	3.25	3.33	3.43	3.30	3.43
	(.96)	(.96)	(1.06)	(1.18)	(.86)	(.86)	(1.01)	(.94)
FESU-S	4.10	4.38	4.23	4.61	4.00	3.87	4.17	4.41
	(.88)	(.97)	(.66)	(1.64)	(1.12)	(1.09)	(.60)	(.50)
subsyndromal depression								
CES-D	16.64	15.44	13.85	13.99	17.10	14.75	17.17	18.07
	(4.87)	(8.50)	(7.01)	(7.79)	(4.08)	(8.10)	(8.55)	(9.21)
ATQ	52.10	50.36	44.00	47.16	56.63	48.47	45.91	51.21
	(13.13)	(20.01)	(13.86)	(16.24)	(15.35)	(18.21)	(15.30)	(17.98)

Table 1:

Descriptive statistics of the CES-D, ATQ, and FESU, separated according to time of measurement and group (cont).

FESU-N	2.22	2.15	2.46	2.08	2.60	2.67	2.53	2.59
	(1.24)	(1.37)	(1.86)	(1.49)	(1.07)	(1.28)	(1.09)	(1.37)
FESU-F	3.31	3.43	3.45	3.44	3.50	3.21	3.50	3.47
	(.88)	(1.00)	(.76)	(.82)	(.89)	(.80)	(.96)	(1.00)
FESU-S	4.13	4.13	4.12	4.20	4.07	4.10	4.28	4.37
	(.78)	(.88)	(.63)	(.62)	(1.03)	(.54)	(.62)	(1.68)
clinically relevant symptoms								
CES-D	33.85	21.56	22.67	23.60	34.93	13.47	20.42	20.00
	(7.01)	(11.51)	(15.58)	(13.85)	(5.04)	(10.99)	(9.32)	(7.64)
ATQ	87.17	67.88	57.00	74.25	93.00	56.46	57.15	57.83
	(27.50)	(28.07)	(8.64)	(28.86)	(31.00)	(24.26)	(23.38)	(17.91)
FESU-N	2.15	2.37	1.75	1.67	2.18	2.03	2.22	2.02
	(1.47)	(2.36)	(.70)	(.96)	(1.13)	(.78)	(.49)	(.61)
FESU-F	3.71	3.42	3.83	3.20	3.49	3.35	3.54	3.60
	(.84)	(1.31)	(1.10)	(1.30)	(.63)	(.97)	(.62)	(.94)
FESU-S	4.12	3.72	3.88	4.07	4.04	4.24	4.12	4.11
	(.72)	(.96)	(.96)	(.39)	(.59)	(.52)	(.54)	(.65)

Footnote: CES-D = Center for Epidemiological Studies – Depression Scale, ATQ = Automatic Thoughts Questionnaire, FESU-N = Questionnaire for Social Support subscale: extent of network; FESU-F = Subscale: frequency; FESU-S = Subscale: satisfaction; T1 = pre-measurement; T2 = post-measurement; T3 = 3-month follow-up; T4 = 6-month follow-up

Table 2:

CES-D scores: simple main effects and t-tests for experimental conditions and risk status over all measurements.

	single main effects			T1 – T2			T1 – T3			T1 – T4		
	F-value	df	p	t-value	df	p	t-value	df	p	t-value	df	p
minimal symptoms												
LISA-T	4.80	3/111.94	.003**	- 2.76	59	.008	- 3.29	63	.002	-2.03	58	.047
LISA-C	13.81	3/76.41	.0001**	- 3.94	40	.0001**	- 3.74	39	.001*	- 4.15	40	.0001**
subsyndromal depressive disorder												
LISA-T	4.47	3/153.44	.005*	1.41	71	.163	3.15	72	.002	3.34	71	.001*
LISA-C	1.75	3/81.30	.164	-	-	-	-	-	-	-	-	-
clinically relevant symptoms												
LISA-T	2.24	3/6.92	.172	-	-	-	-	-	-	-	-	-
LISA-C	22.46	3/22.84	.0001**	8.37	14	.0001**	4.29	11	.001*	6.28	11	.0001**

Footnote: Only t-test for significant simple main effects are presented; LISA-T = training group; LISA-C = control group; - = non calculated t-tests; single main effects: ** p ≤ .004; * p ≤ .008; t-tests: * p ≤ .001; ** p ≤ .0001