Title: There is strong evidence that behavioral activation is as effective as conventional treatment at decreasing depressive symptoms in adults with depression.

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CLINICAL SCENARIO:
Client Population: The client population this intervention targets is adults who are at least 18 years of age with depression.

Treatment Context: The articles reviewed for this CAT used behavioral activation in inpatient and outpatient settings.

Problem/Condition this Intervention Addresses: This intervention targets individuals diagnosed with major depressive disorder, or individuals presenting with depressive symptoms.

Intervention Explanation: The behavioral activation (BA) model focuses on patterns of avoidance and withdrawal from daily activities that are frequently associated with depression. Therapists administering BA guide patients in developing daily routines that increase the patient's interaction with their environment. Activities that are meaningful and of interest to the patient are scheduled to occupy the majority of his or her day. This component of BA, activity scheduling, is a common component in the various forms of behavioral activation. Positive reinforcement is received from activity completion, even in the presence of depressive symptoms. The goal of BA is to help the patient develop stable sources of positive reinforcement in their environment. In the long term, the positive reinforcement leads to less aversion from interacting with one's environment (Kanter, Busch & Rusch, 2009). While cognitive changes may accompany the changes in behavior, cognition is not the focus of behavioral activation interventions.

Science behind Intervention: Research about the mechanisms of BA in the brain is limited. A study examining the effects of behavioral activation for patients with major depressive disorder (MDD) using functional magnetic resonance imaging (fMRI) of the brain has shown that BA may reduce the hyperactivity of the prefrontal cortex in these patients. For instance, when presenting visual stimuli, embedded in both sad and neutral contexts to individuals with MDD receiving BA treatment, reductions in brain activity occur, particularly in the paracingulate gyrus, right orbital frontal cortex, right frontal pole, and left postcentral gyrus (Dichter, 2010). These areas have been shown to control treatment response, emotional evaluations, executive controls, and cognitive operations. There is a relationship between the amount of physical

activity and individual participates in and the incidence of depression (Stawbridge et al. 2002). Thus, BA theory postulates that by targeting an individual's level or participation in activities and their patterns of behavior, depression can be effectively reduced. Avoidance behaviors are also addressed because it has been shown to initially limit the amount of distress a person experiences, however, long-term avoidance leads to less positive experiences with the environment and further complications due to overall decreased activity (Dimidjian et al., 2006).

How Intervention is Appropriate for Occupational Therapy: Although occupational therapy is absent from current behavioral activation literature, occupational therapists possess a unique skill set that puts them in a favorable position for implementing this intervention. Therapists may incorporate their client's valued occupations into the behavioral activation treatment. This promotes an occupation-based approach because it uses valued occupations as the means of treatment for this intervention. Therefore, symptom management and occupational participation may be addressed concurrently. This is also a client-centered approach, as the client and therapist collaborate to determine appropriate client goals, and to identify ways for the client to become more engaged in his or her environment. Additionally, performance patterns are addressed in behavioral activation through helping the patient develop more positive habits and routines to promote healthy interactions with the environment (American Occupational Therapy Association, 2008).

FOCUSED CLINICAL QUESTION: Is behavioral activation more effective than conventional treatment at decreasing depressive symptoms in adults with depression?

SUMMARY:

The clinical question for this Critically Appraised Topic (CAT) is as follows: is behavioral activation more effective than conventional treatment at decreasing depressive symptoms in adults with depression? A search of 11 databases located 17 relevant articles, from which three articles were selected to critique for this CAT. Two of the appraised articles are rigorous RCT's with PEDro Scale ratings of 6 out of 8 and 7 out of 8. The third appraised article is a well-designed meta-analysis. All three appraised articles in this CAT explored the use of BA in adults exhibiting symptoms of depression. The three articles were chosen because of their rigorous study designs and relevant populations. The meta-analysis was also selected based on the rigorous study design, the comparison of BA to several control and conventional treatment groups, and the specific focus on activity scheduling as an intervention strategy. Findings suggest behavioral activation's efficacy as a treatment for depressive symptoms in adults with depression. BA was shown to be as effective as, and in individuals with high-severity depression, more effective than conventional interventions.

CLINICAL BOTTOM LINE: There is strong (1a) evidence that behavioral activation is as effective as conventional treatment at decreasing depressive symptoms in adults with depression.

Limitation of this CAT: This critically appraised topic has been reviewed by occupational therapy graduate students and the course instructor.

SEARCH STRATEGY:

Table 1: Search Strategy

Databases Searched	**Search Terms**	**Limits used**	**Inclusion and Exclusion Criteria**
PsycARTICLES OTSeeker MEDLINE PubMed Cochrane EBSCO Host OVID OT CATS PEDro REHAB DATA OT Search	-Behavioral Activation, Depression, Trial -Behavioral activation -Behavioral Activation, Depression	- " " - AND - Full text - Keywords in Title/Abstract - Free full text available	Inclusion: -2002-2012 -English-only articles Exclusion: -articles older than 2002

RESULTS OF SEARCH

Table 2: Summary of Study Designs of Articles Retrieved

Level	Study Design/ Methodology of Articles Retrieved	Total Number Located	Data Base Source	Citation (Name, Year)
Level 1a	Systematic Reviews or Metanalysis of Randomized Control Trials	3	PsycInfo, PsycARTICLES	-Chartier, S.I., Provencher, M.D. (2012). Cuijpers, P., van Straten, A.,

				Warmerdam, L. (2007) -Sturmey, P. (2009)
Level 1b	Individualized Randomized Control Trials	4	Academic Search Premier, PsycARTICLES, Cochrane Central Register of Controlled Trials	-Coffman, S. J., Martell, C. R., Dimidjian, S., Gallop, R., & Hollon, S. D. (2007). - Dimidjian, S., Hollon, S.D., Dobson, K.S., Schmaling, K.B., Kohlenberg, R.J., Addis, M.E., Gallop, R., McGlinchey, J.B., Markley, D.K., Gollan, J.K., Atkins, D.C., Dunner, D.L., Jacobson, N.S. (2006) -Dobson, K. S., Dimidjian, S., Kohlenberg, R. J., Hollon, S. D., Schmaling, K. B., Gallop, R. J., & ... Jacobson, N. S. (2008) -Hopko, D. R., Lejuez, C. W., LePage, J.P., Hopko, S.D., McNeil, D.W. (2003)

Level 2a	Systematic reviews of cohort studies	0		
Level 2b	Individualized cohort studies and low quality RCT's (PEDRO < 6)	1	CINAHL	-Yon, A., & Scogin, F. (2009)
Level 3a	Systematic review of case-control studies	0		
Level 3b	Case-control studies and non-randomized controlled trials	4	Academic Search Complete, PscyINFO, MEDLINE, CINAHL.	-Dichter, G.S., Felder, J.N. & Smoski, M.J. (2010) -Gros, D.F. & Haren, W.B. (2011) -Hunnicutt-Ferguson, K., Hoxha, D., & Gollan, J. (2012) -Jakupcak M., Wagner A., Paulson A., Varra A., McFall M. (2010)
Level 4	Case-series and poor quality cohort and case-control studies	2	ERIC	-Bottonari, K., Roberts, J., Thomas, S., & Read, J. (2008) -Hopko, D. R., Robertson, S. M. C., & Colman, L.(2008)
Level 5	Expert Opinion	0		
Not Applicable	Non-intervention Studies	3	Academic Search Complete, PsycINFO	-Clignet, F., van Meijer, B., van

				Straten, A. & Cuijpers, P. (2012) -Jacobson, N. S., Martell, C. R., & Dimidjian, S. (2001) -Ly, K.H., Carlbring, P., & Anderson, G. (2012)

Table 3: Summary of Included Studies

	Study 1 Dimidjian, S., Hollon, S.D., Dobson, K.S., Schmaling, K.B., Kohlenberg, R.J., Addis, M.E., Gallop, R., McGlinchey, J.B., Markley, D.K., Gollan, J.K., Atkins, D.C., Dunner, D.L., Jacobson, N.S. (2006).	**Study 2** Hopko, D., Armento, M., Robertson, S., Ryba, M., Carvalho, J., Colman, L., Mullane, C., & Gawrysiak, M. (2011). Brief behavioral activation and problem-solving therapy for depressed breast cancer patients: Randomized trial. *Journal of Consulting and Clinical Psychology, 79*(6): 834-849. doi: 10.1037/a0025450	**Study 3** Cuijpers, P., van Straten, A., Warmerdam, L. (2007). Behavioral activation treatments of depression: A meta-analysis. *Clinical Psychology Review, 27*, 318-326. doi:10.1016/j.cpr.2006.11.001
Design and PEDRO rating	Individualized Randomized Control Trial. 6/8	Randomized Control Trial 7/8	Meta- Analysis N/A
Population	Adults 18-60 who met criteria for major depression according to the DSM-IV and scored 20 or higher on the Beck	Adults 18 or older who were diagnosed with breast cancer, who scored 9 or higher on the Harvard National	Adults age 18-68+ with a depressive disorder or an elevated level of depressive symptomatology

	Depression Inventory and 14 or greater on the 17-item Hamilton Rating Scale for Depression	Depression Screening Scale, and who had a principal and primary consensus diagnosis of major depression of moderate severity (a 4 on a 0 [no depressive symptoms] to 8 [very severe symptoms] scale) as measured by responses to the Anxiety Disorders Interview Schedule-IV and the Hamilton Rating Scale for Depression.	
Intervention Investigated	Behavioral Activation Treatment - expanded version -Self-monitoring, structuring and scheduling daily activities, rating pleasure and accomplishment associated with activities, exploring alternative behaviors, role-playing, assessment and treatment of avoidance behaviors, the establishment or maintenance of regularized routine, and behavioral strategies for targeting rumination -maximum of twenty-four 50-min sessions over 16 weeks with sessions generally held twice weekly for the first 8 weeks and	Behavioral Activation Therapy for Depression -Brief version -Assessing function of depressed behavior, motivational exercises, psychoeducation about depression and how it relates to breast cancer, self-monitoring, rating pleasure and accomplishment associated with activities, identifying values and goals, construction of activity hierarchy, collaborating with therapist to create weekly routines and goals, examining and discussing weekly goal attainment with therapist, practicing	Behavioral Activation –Activity scheduling -Considered to be activity scheduling when core elements of treatment included registration of pleasant activities and the increase of positive interactions between a person and his or her environment -social skills training could be a part of the intervention

	once weekly for the next 8 weeks	anxiety reduction strategies, and exposure exercises -8 sessions of approximately 1 hour-long sessions	
Comparison Intervention	Cognitive Therapy -targeting the areas of behavioral dysfunction, situation specific negative thinking and cognitive distortions, an underlying dysfunctional beliefs or cognitions assumed to be related to the participant's current depression and risk of future depression -twenty-four 50-min sessions over 16 weeks Antidepressant Medication - medication started at 10mg/day of paroxetine, increased to 20mg second week, 30mg fourth week, 40mg sixth week, max dose of 50mg twelfth week -sessions weekly for first 4 weeks and biweekly thereafter through week 16 - first session 30-45 min and subsequent sessions up to 30 min. Placebo Medication -same as ADM except termination occurred at week 8 (and then given	Problem-Solving Therapy -motivational exercises, psychoeducation about depression and how it relates to breast cancer, introduction to the PST treatment rationale, creating a list of current problems in each participant's life, collaborating with therapist to solve a problem of their choosing (establish goals for problem resolution, generate possible solutions, evaluate and choose solution, implement chosen solution, and evaluating the outcome), practicing anxiety reduction strategies and exposure exercises -8 sessions of approximately 1 hour-long sessions psychotherapy sessions 1 hour in duration	Varies - waiting list, cognitive therapy, supportive therapy, psychodynamic therapy, nondirective therapy, counseling, problem solving therapy, social skills training, cognitive therapy + activity scheduling, antidepressant medication

	choice of ADM, CT, or BA)		
Dependent Variables	Depression symptom severity	Depression symptom severity	Depression symptom severity
Outcome Measures	-Hamilton Rating Scale for Depression -Beck Depression Inventory-II	-Hamilton Rating Scale for Depression -Beck Depression Inventory-II -The Environmental Reward Observation Scale -Beck Anxiety Inventory -Quality of Life Inventory -Medical Outcomes Study Short Form -Multidimensional Scale of Perceived Social Support -Client Satisfaction Questionnaire	Varies: -Hamilton Rating Scale for Depression -Beck Depression Inventory-II -Minnesota Multiphasic Personality Inventory-Depression Scale -Zung Self-Rated Depression Scale -Brief Symptom Inventory- Depression Cornell Scale for Depression in Dementia
Results	Low-severity subgroup: significant overall improvement by time for all groups on the BDI $F(1,62)=166.10$, $p<.0001$ and on the HRSD $F(1,146)=193.02$, $p<.0001$ but there was no evidence of any treatment being statistically significantly more effective than another on the BDI $F(2,60)=0.47$,	Significant pre-post intervention improvement was observed on BDI-II and HRSD. Treatment improvements were clinically significant as indicated by large effect sizes on depression symptom severity outcomes.	In this study, behavioral activation was found to be more effective than control groups at post-test, and equally as effective as other psychological treatments, cognitive therapy, antidepressant medication, and a combination of cognitive therapy and activity scheduling at

	p=.63 or on the HRSD F(2,144)=0.05, p=.95 High-severity subgroup: significantly greater percentage of BA participants met BDI response criteria as compared with both participants receiving CT $\chi 2(1, N=50)=3.92$, p=0.48 or those receiving ADM $\chi 2(1, N=82)=4.91$, p=.027 Rates of remission based on BDI: CT 40% (N=10), BA 52% (N=13), ADM 42% (N=24) - No significant differences between treatments $\chi 2(2, N=107)=.99$, p=.61 based on HRSD: CT 36% (N=9), BA 56% (N=14), ADM 23% (N=13) - significant differences between treatments $\chi 2(2, N=107)=8.88$, p=.012 with a significantly greater percentage of BA participants reaching remission as compared with ADM participants $\chi 2(1, N=82)=9.82$, p=.002	Based on follow-up data, In no analysis for either treatment group did an outcome change in the direction of pretreatment levels.	post-test. Behavioral activation was also found to be more effective than control groups at up to 6 months follow-up, and as effective as conventional interventions at up to one-year follow-up. Low heterogeneity was found in all meta-analyses (I^2 ranging from 0.0 to 30.84), except for analysis of effects from post-test to 7-12 months follow-up (I^2=51.71).
Effect Size	BA over CT: 0.87 BDI, 0.59 HRSD ADM over CT: 0.96 BDI, 0.51 HRSD ADM over BA: 0.09 BDI, 0.01 HRSD	BDI-II - group X time interaction 0.04 -BATD: 1.55 -PST: 1.75 HRSD - group X time interaction 0.04 -BATD: 1.91 -PST: 2.28	-AS vs. control condition: 0.87 - AS vs. all treatments (not WL or placebo): 0.12 -AS vs. CT: 0.01 -AS vs. CT + AS: -0.01 -AS vs. ADM: 0.26

			-AS vs. control from post-test to 1-3 months follow-up: 0.18 -AS vs. control from post-test to 4-6 months follow-up: 0.03 -AS vs. control from post-test to 7-12 months follow-up: 0.53 -AS vs. CT at 1-3 months follow-up: 0.02 -AS vs. CT at 4-6 months follow-up: -0.13
Conclusion	Behavioral activation is as effective as anti-depressant medication at decreasing depression symptom severity	Behavioral Activation therapy in the treatment of depressive symptoms in breast cancer patients with a primary diagnosis of depression.	Behavioral activation is as effective as other psychological treatments and treatment with antidepressants at decreasing depression symptom severity in depressed adults regardless of age of patient, patient baseline severity of depression, and whether intervention was provided to a group or individually. This is true at post-test as well as at follow-up periods up to six months.

Overall Conclusions

Behavioral activation is a form of cognitive behavioral therapy in which the link between avoidant behavior and depressive symptoms is addressed. The core elements of BA interventions include increasing positive interactions between an individual and his or her environment, and

the registration of pleasant activities (Lewinsohn et al., 1976). Stable and diverse sources of positive reinforcement are seen as contributing to the function and meaning of life. Activity scheduling is an intervention that is central to addressing these elements within the BA model. Within the behavioral activation model, activities are scheduled based on the function they serve for each individual rather than a general prescription of activities for all patients.

Depression was defined in these studies as either DSM-IV diagnoses of major depressive disorder or depression using a self-rating scale. All three of the appraised articles measured severity of depressive symptoms through various outcome measures such as the Beck Depression Inventory 2 (BDI-II) and the Hamilton Rating Scale for Depression (HRSD) and others. None of the studies controlled for how long the participants had been experiencing depressive symptoms or whether or not they had experienced depressive episodes in the past.

Across all three appraised articles behavioral activation (BA) was shown to be more effective than control groups receiving no treatment at decreasing depressive symptoms in adults with depression as shown by the large effect sizes as measured immediately after treatment (Dimidjian et al., 2006; Cuijpers, van Straten & Warmerdam, 2007). Two articles (Cuijpers et al., 2007; Hopko et al., 2011) found behavioral activation to be as effective as conventional cognitive interventions as shown by the small effect sizes between BA and conventional cognitive therapies, while one article (Dimidjian et al., 2006) found behavioral activation to be *more* effective than cognitive therapies in patients with high severity depression. Additionally, the positive effects of treatment were retained during the six months following the study. BA was also found to be as effective as antidepressant medication at decreasing depressive symptoms, as seen in the small effect sizes between BA and antidepressant medication groups in both studies that compared the effectiveness of these two interventions (Dimidjian et al., 2006; Cuijpers et al., 2007).

There were differences in the frequency and duration of treatment, however, all of the studies found BA to be as effective as, or more effective than, standard treatment or no treatment. This would mean that the length of treatment and number of sessions did not change the effectiveness of the treatment. Hopko et al. (2011) used eight one hour sessions of activity scheduling over an eight week period of time, (total of 64 hours) and Dimidjian et al. (2006) used 24 fifty minute sessions over a 16 week period (total of 20 hours). The meta-analysis included studies which used various numbers of sessions, ranging from four sessions to twenty (Cuijpers, van Straten, & Warmerdam, 2007).

The intervention varied between studies. The meta-analysis (Cuijpers, van Straten & Warmerdam, 2007) used any treatment that included activity scheduling. Additional interventions, such as depression psychoeducation, self-monitoring, assessing the reward or pleasure associated with activities, anxiety reduction strategies, motivational exercises, behavioral exposure exercises, exploring alternative behaviors, role-playing, and behavioral strategies for targeting rumination were included in the other studies (Hopko et al., 2011; Dimidjian et al., 2006). Hopko et al. (2011) also investigated BA with participants with

depression secondary to a medical condition. All interventions were one-on-one except for a few studies within the meta-analysis which used a group therapy design (Cuijpers et al., 2007).

The BDI-II and the HRSD were used to quantify severity of depression in both of the randomized control trials (RCTs), as well as in many of the studies included in the meta-analysis. Measurements were taken at baseline and immediately post-treatment in all reviewed articles, with the exception of a few of the studies included in the meta-analysis. Several studies also measured depression symptoms at follow up, with a maximum length of 24 months post-intervention. All interventions were provided in an outpatient setting except for a few of the individual studies reviewed in the meta-analysis (Cuijpers et al., 2007) which were in inpatient settings or not reported.

Behavioral activation resulted in statistically significant improvement in depressive symptoms when, at a minimum, activity scheduling was used. It appears to be a robust intervention as it was effective over a variety of treatment times and with different populations. Reductions in depressive symptoms were noted up to one year post-intervention.

Boundaries

The studies evaluated included a total of 1,101 participants who were 18 to 68+ years of age. Participants were clinically depressed but there were no restrictions on recent hospitalization status (inpatient or outpatient) or medication use. Exclusion criteria was different for each study and included diagnosis of bipolar disorder, psychosis, mental retardation, or drug/alcohol abuse, primary diagnosis other than depression, and not responding well within the last year to either cognitive therapy or paroxetine antidepressant medication. The majority of participants within both RCTs were Caucasian.

Implications for Practice

These studies demonstrated that behavioral activation was as effective as, or more effective than traditional forms of treatment in adults with depressive symptoms up to one year post intervention. Behavioral activation treatment lengths varied from 4-20 sessions and participants were seen individually or in groups by the clinician. These sessions were 50-60 minutes long, lasted between 8-16 weeks, and symptom improvement was seen in all studies. Symptom improvement was seen in as little as four treatment sessions in some instances. Interventions focusing just on the activity scheduling component of BA were also found to be as effective as traditional cognitive therapy. This area should be evaluated further to determine if the other components of BA are necessary for this intervention to be effective.

Research cited validates the effectiveness of BA across various practice settings, various treatment protocols, and populations. Research regarding the effectiveness of BA when administered by occupational therapists and whether the treatment increases occupational performance should be explored. Future research should also examine what types of certifications an individual should receive in order to effectively administer BA. Additional research should also examine which components of BA are most effective in decreasing depressive symptoms.

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