



Mount Saint Mary College Journal of Psychology Research Proposals
<http://brainwaves.msmc.edu>

The Effect of Exercise Therapy Versus Bright Light Therapy on Patients with Seasonal Affective Disorder

Juljana Sinani

Mount Saint Mary College, Newburgh, New York

Physical activity is well documented across studies for reducing depressive symptoms. One mechanism by which exercise may decrease depression is via endorphins, a chemical hormone the body releases. Depression is caused by many factors. I propose an experimental study to investigate how bright light and exercise therapy influences seasonal affective disorder. 150 participants with seasonal depression, 150 participants with major depression and 150 non-depressed individuals will be recruited from the Northeast region of the United States. Two types of treatment for seasonal depression will be used: bright light therapy and exercise therapy. All the participants will undergo both bright light therapy and the exercise treatment. The participants' depression symptoms will be measured by the Hamilton Depression Score and the Seasonal Pattern Assessment Questionnaire. In this study, I hypothesize that the exercise treatment will be more effective in reducing depression symptoms than bright light therapy in patients with seasonal depression.

Pages: 35-40

Depression is the most common mental disorder today; known as the "common flu" of the psychological disorders (reviewed in Myers, 2007). 5.8% of men and 9.5% of women suffer from depression every year in the world (reviewed in Myers, 2007). Depression is also the most common reason that people seek help at the mental health services. Depression is a mood disorder, which is characterized by feelings of loneliness and sadness, loss of interests in activities, fatigue, dramatic weight gain/weight loss, impaired concentration, and insomnia (reviewed in Myers, 2007).

The major difference between the depressive disorder and a normal sadness in daily life is that in depression, five or more specified symptoms have to be present, such as sadness, loneliness, fatigue, increased sleep and weight gain; and symptoms last at least two weeks. Causes of depression include physical and emotional abuse. Medications such as those used to treat high blood pressure, genetics, and major events such as the loss of a loved one, drug abuse and a serious illness such as cancer (reviewed in Myers, 2007). As a

consequence of depression, people are unable to do their job effectively because of their lack of energy. They disconnect from their family so this adds frustration in all the family members and feelings of neglect (reviewed in Myers, 2007). A major consequence is also social isolation and the most fatal consequence is death (reviewed in Myers, 2007). If depression is left untreated feelings of sadness and hopelessness can increase and drive the person to suicide (Myers, 2007). One particular type of depression is Seasonal Affective Disorder. Seasonal depression happens mostly during the fall and winter season. A patient is diagnosed with seasonal depression the same way as in major depression, except that they have to have two or more depressive episodes that have happened in a seasonal pattern. Symptoms of seasonal depression are increased appetite, weight gain, increased sleep, decreased energy, fatigue, and lack of physical activity. These symptoms are known as the hibernation symptoms (Sigmon, Schartel, Boulard, Thorpe, 2010). Sigmon et al (2010) suggested that biological and environmental factors such as increased melatonin secretion, circadian cyclic abnormalities and reduced amount of sunlight play an important role in seasonal depression. The circadian rhythmic cycles are controlled by the suprachiasmatic nuclei (SCN) located in the medial hypothalamus. The circadian cycles are electrical, metabolic and

¹ **Juljana Sinani** (jsino832@my.msmc.edu) is a senior graduating in December 2012 with a B.A in Psychology and a minor in General Sciences.

biochemical mechanisms which include the cycles of hunger, thirst, sleep, etc. These circadian cycles are regulated by the light and dark cycle of the 24 hour day. As reviewed in Pinel (2011) melatonin plays an important role also in this light and dark cycle. Melatonin is a hormone which is synthesized by the neurotransmitter of serotonin in the pineal gland. The pineal gland is located in the midline of the brain just in the bottom of the end of the corpus callosum. It is documented that high levels of melatonin happen during darkness. Low levels of melatonin are associated with light. Thus, melatonin is the hormone behind the circadian clock because it controls the wake and sleep periods. A simple way to define it is that, melatonin is the hormone that puts you to sleep and its secretion is directly affected by light (reviewed in Pinel, 2011).

One of the major differences between seasonal depression and major depression is that seasonal depression, as suggested from its name, is a depression that is influenced by the season. Different from the mood decrease symptoms which are common in regular depression, seasonal depression also has hyperphagia and hypersomnia symptoms (Sigmon et al., 2010). Hyperphagia is increased appetite and hypersomnia is increased sleep. These symptoms are opposite to the symptoms in regular depression which are loss of appetite, weight and sleep. (Sigmon et al., 2010).

In North America, the rate of people suffering from seasonal depression is between 0.4% and 2.7%. In Northern Europe, 2% of people experience seasonal depression. Half of the populations in these northern latitudes such as Northern Europe and North America, which are not diagnosed with depression, experience some symptoms of this disorder in the winter (Keller et al., 2005). Peiser (2009) mentions that the populations that suffer the most from seasonal depression are people living in the Northeast of America because of cold winters. This shows that weather and the environment may play a major role in seasonal depression. Studies suggest that women are twice more likely to have seasonal depression than men (Lam and Levitan, 2000).

One non pharmaceutical treatment used for seasonal depression is the bright light treatment. The bright light treatment is the most common treatment for seasonal depression. This particular treatment exposes the patient to artificial bright light which is at least 2500 lux (Parton, 1998). 2500 lux is the minimum amount to suppress melatonin secretion. Bright light therapy is usually effective for 80% of the patients with seasonal depression. Bright light therapy is effective as a treatment because bright light is the synchronizer in the circadian rhythm (Lam and Levitan, 2000). Peiser (2009) reviews how one of the causes of seasonal depression is the disruptive phase changes of the circadian cycle which is mentioned above as circadian abnormalities; due to the shorter daylight in winter. Bright light therapy can regulate these phase changes by suppressing the release of melatonin. Thus, light therapy is effective in regulating the circadian phase changes in winter that cause seasonal depression (Lewy, Lefler, Emens, & Bauer, 2006). These phase changes are based on the phase shift hypothesis

which states that, bright light could correct the sleep/wake cycle by regulating the phase delay and phase advance (Lewvy et al., 2006). The phase delay concept states that patients with seasonal depression become depressed in winter because of the late dawn. The phase advance concept states that patients become depressed because of the early dusk in winter (Lewvy et al., 2006). Both of these concepts convey the idea that the shortage of light period causes seasonal depression in the winter season. Lewy, Sack, Miller, & Hoban(1987) experimented on the effect of bright light therapy on seasonal depressed patients. The researchers randomly assigned patients in two groups: one group of patients got the bright light treatment in the morning, right after they woke up and the other group got the bright light treatment in the evening just before they went to sleep. They found that the timing of the bright light treatment was really important. At the end of two weeks, the researchers switched the groups; the patients that got the morning treatment in the first two weeks, got the evening treatment for the second two weeks, thus both of the groups went through both treatments. There was a third condition, the control group which did not receive any treatment. After the first two weeks the researchers found that the group that received the evening treatment was significantly less depressed than the morning group. After four weeks there was no difference between the experimental groups but the patients in both morning and evening treatment were significantly less depressed than the control group. The levels of melatonin measured were lower in the experimental groups also than in the control group. In a case study done by Moscovici (2006) in Israel showed also that, bright light therapy had significant positive results in the patient suffering from seasonal depression.

Studies suggest that physical exercise may be an effective treatment for seasonal depression. There has been a lot of research that has shown that, physical exercise has a positive effect on depression. Thus, physical exercise as a possible treatment for seasonal depression has been promising. Physical activity is also known to affect melatonin secretion and the circadian cycle however it is not clearly understood how. Dunlap et al. (2007) found that exercise reduces the melatonin levels. With this effect, patients can feel less tired and sleepy. This reduces the increased sleep and decreased energy symptoms.

Kerse et al. (2010) found that exercise was related to positive improvements in depression in older people. Sund et al. (2010) investigated the effect of exercise on depression in early adolescents. Two types of activities were used in this experimental study: physical and sedentary. Sund et al. (2010) found that increasing vigorous physical activity and decreasing sedentary activity, decreases major depression symptoms. The study claimed that a reason for this is that high levels of physical activity moderates high levels of stressful events. This displays also that the type of physical activity that patients are involved in is important. Barton et al. (2012) suggested that the environment where the patients exercised had a significant effect on their mood. In this experimental study, the depressed patients

were assigned in three different types of exercise programs and it was found, that the green exercise program which involved walking outside with other people had the most beneficial effect on reducing depression symptoms and increasing mood. Sigmon et al. (2010) study shows that people with seasonal depression had a significant decrease in mood and energy levels due to weather. Babyak et al. (2000) suggests that physical exercise can be very effective for people with seasonal depression because it can prevent a decrease in their mood despite the weather. In some studies, bright light therapy is used together with physical exercise to get the best results, such as in the Putilov et al. (2005) study which measured the effects of these combined treatments in seasonal and non-seasonal depressive people. The researchers did not find any significant difference between the seasonal and non- seasonal group but their study showed that the combination of bright light therapy with physical exercise in midday was very effective for people with seasonal depression. This study will investigate the effect that physical activity has on depressive symptoms in people with seasonal affective disorder or otherwise known as seasonal depression. While a lot of research has been done on bright light therapy and seasonal depression, not a lot of research has been done on exercise and seasonal depression. Some studies have combined but not isolated exercise. Different from the Putilov study, I will test the extent to which exercise can be effective. Therefore, the hypothesis of this experiment is that exercise will be more effective in treating seasonal depression than bright light therapy.

PROPOSED METHOD

Participants

In this experiment a total of 450 participants will be recruited from the Northeast area of the United States. Participants will be chosen from this area because seasonal depression is more prevalent in this area of the United States because of its cold winters. In this investigation, all the participants will be paid to participate in the treatment programs. I will recruit approximately 150 patients previously diagnosed with major depression. The severity of their depression will be moderate. 150 participants will be patients previously diagnosed with seasonal depression, and the last 150 will be non-depressed people. All three samples will only look at adults (18 and older) and include both males and females.

Materials and Measures

To evaluate the severity of the depressive symptoms, patients will be interviewed using the Hamilton Depression Score and the Seasonal Pattern Assessment Questionnaire. The Hamilton Depression Score will measure the general depressive symptoms. The Seasonal Pattern Assessment Questionnaire will measure the depression symptoms for seasonal depression

specifically. The patient's depressive condition will be measured by both questionnaires at the beginning of the experiment and then every two months. In the bright light treatment, the participants will be exposed to bright light of 2500 lux for one hour in the morning from 8:00 – 9:00 A and one hour in the evening from 8:00- 9:00 P. In the exercise treatment, the participants will exercise five days a week. Three days a week, they will do aerobic exercises for about one hour a day and two days a week they will do swimming for one hour. The sessions will take place in the in the morning from 9:00 – 12:00 Pm or in the afternoon from 4:00- 6:00Pm, in a gym. This is to accommodate the participant's schedule. Each session will be supervised by a physiotherapist who will take attendance and attend to the participants needs.

Procedure

This experiment will take place for over three years in the winter season, during the months of October till March. There will be three conditions that the major depressed, seasonal depressed and non- depressed participants will participate. The conditions are: bright light treatment, exercise treatment and no exercise/no bright light treatment which will be the control group. The experimental design of this experiment is within groups design. There will be about 150 participants in the seasonal depressed group which will be randomly assigned to one of the conditions. In the first year, 50 of these participants will be assigned in the exercise group, another 50 will be assigned to the bright light treatment and the last 50 will be assigned to the no exercise/no bright light treatment. In the second and third year, the participants who were in the exercise treatment the first year will be assigned to the bright light treatment, and then in the no exercise/no bright light treatment. Those which were in the bright light treatment will be assigned in the exercise treatment and then in the no exercise/no bright light treatment. The participants who were in the no exercise/no bright light treatment will then switch to the exercise and bright light treatment the following two years. Each group will have the chance to participate in all three conditions at the end of three years. The purpose of this is to see which treatment has the most beneficial effect, the exercise or the bright light treatment. The participants in the major depressed and healthy groups will be assigned in the conditions using the same procedure. Every year means on the depression questionnaires will be compared between groups. At the end of three years, there will be a within subject comparison of scores on the depression scale.

CONCLUDING REMARKS

Significance

Since there is little research that investigates the effect of exercise on seasonal depression this study is expected to expand the knowledge on how exercise affects seasonally depressed people. This study will also contribute by

investigating the best treatment for seasonally depressed people by comparing the two treatments which are commonly used: bright light therapy and exercise therapy. This study will also compare how big the effect of these treatments will be for seasonally depressed people by comparing it to the regular depressed and non- depressed people.

Limitations

Even though the patients will be paid for their participation, it may be challenging to have the participants participate until the end of the program. The effect of one treatment may linger while undergoing a different treatment.

REFERENCES

Atkinson, G., Edwards, B., Reilly, T., & Waterhouse, J. (2007). Exercise as a synchronizer of human circadian rhythms: An update and discussion of methodological problems. *Journal of Cognitive Behavioral Therapy*, 99, 331-341. doi: 10.1007/500421-006-0361-7

Babiyak, M., Blumenthal, J., Herman, S., Khatri, P., Doraiswamy, M., & Moore, K. (2000). Exercise treatment for major depression: Maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine*, 62, 633-638. doi: 0033-3174/00/6205-0633

Barton, J., Griffin, M., & Pretty, J. (2012). Exercise nature and socially interactive- based initiatives improve mood and self- esteem in the clinical population. *Perspectives in Public Health*, 132(2), 89-95. doi: 10.1177/1757913910393362

Chen, L.H., Wei, J., Huang, H. C., & Lin, C. W. (2010). Mediating effect of symptom severity on the relationship between self-efficacy for exercise and depression. *Journal of Clinical Nursing*, 20, 294-296. doi: 10.1111/j.1365-2702.2010.03488.x

Keller, M. C., Fredrickson, B. L., Tbara, O., Cote, S., Johnson, K., Mikels, J., Conway, A., Wager, T. (2005). A warm heart and a clear head: The contingent effect of weather on mood and cognition. *Psychological Science Journal*, 16(9), 724-731.

Kerse, N., Hayman, K., Moyes, S., Pery, K., & Robinson, E. (2010). Home based activity program for older people with depressive symptoms: Dellite- A randomized controlled trial. *Annals of Family Medicine*, 8, 214-223

Lam, W., Levitan, R. (2000). Pathophysiology of Seasonal affective disorder: A review. *Journal of Psychiatry and Neuroscience*, 25, 469-480

Lam, R., Levitt, A., Levitan, R., Morehouse, R., Michalak, E., & Tam, E. (2006). The Can- SAD Study: A randomized controlled trial of the effectiveness of light therapy and fluoxetine in patients with Winter Seasonal Affective Disorder. *The American Journal of Psychiatry*, 163(5), 805-812

Lam, R. (1998). Seasonal pattern assessment questionnaire. www.ubcmood.ca/sad/SPAQ-SAD.pdf

Lewy, A., Sack, R., Miller, S., & Hoban, T. (1987). Antidepressant and circadian phase-shifting effects of light. *Science Journal*, 235, 352-354

Lewy, A., Lefler, B., Emens, J., & Bauer, V. (2006). The circadian basis of winter depression. *PNAS Journal*, 103, 7414-7419

Modified Hamilton Depression Scale Questionnaire www.idsgids.org/translations/english/SIGHD-IDSCEnglis-USA.pdf

Moscovici, L. (2006). Bright light therapy for seasonal affective disorder in Israel

(latitude North 32.6): A single case placebo-controlled study. *Acta Psychiatrica*, 114, 216-219. doi: 10.1111/J.1600-0447. 2006. 00844.x

Myers, D. (2007). *Psychology* (8th edition). New York, NY: Worth Publishers

Oeland, A., Laessoe, U., Olesen, A., & Jorgensen-Munk, P. (2010). Impact of exercise on patients with depression and anxiety. *Journal of Psychiatry*, 63(3), 210-215. doi: 10.3109/08039480903511373

Peiser, B. (2009). Seasonal affective disorder and exercise treatment: A review. *Biological Rhythm Research*, 40(1), 85-97. doi: 10.1080/09291010802067171

Pinchasov, B., Shurgaja, A., Grischin, O., & Putilov, A. (2000). Mood and energy regulation in seasonal and non-seasonal depression before and after midday treatment with physical exercise or bright light. *Psychiatry Research Journal*, 138(4), 29-42.

Pinel, J. (2011). *Basics of Biopsychology*. (7th edition). New York, NY: Pearson Publishers

Putilov, A., Pinchasov, B., & Poljakova, E. (2005). Antidepressant effects of mono- and combined non-drug treatments for seasonal and non seasonal depression. *Biological Rhythm Research*, 36(5), 405-421. doi: 10.1080/09291010500218480

Sigmon, S., Scharlet, J., Boulard, N., & Thorpe, G. (2010). Activity level, activity enjoyment, and weather as mediators of physical health risks in seasonal and non seasonal depression. *Journal of Cognitive Behavioral Therapy*, 28, 42-56. doi: 10.1007/s10942-010-0106-0

Sund, A. M., Larson, B., & Wichstrom, L. (2010). Role of physical and sedentary activities in the development of depressive symptoms in early adolescents. *Journal of Cognitive Behavioral Therapy*, 46, 431-441. doi: 10.1007/s00127-010-0208-0

Appendix A

Modified Hamilton Depression Scale Questionnaire

What's your mood been like this past week (compared to when you feel OK)?
 Have you been feeling down or depressed? Sad? Hopeless? Helpless? Worthless?
 - IF YES: Can you describe what this feeling has been like for you? How bad is the feeling?
 Have you been crying at all?
How have you been feeling about the future? (optimistic/pessimistic) Do you feel better with encouragement/ reassurance from others? Do you feel things will get better, improve, and work out?
IF DEPRESSED: In the past week, when something good, even small things have happened, did your mood brighten up? How long did this brightened mood last? Were there things that occurred that should have brightened your mood but did not? In the last week, how often have you felt (OWN EQUIVALENT)? Every day? All day?
HAMD ITEM IDS-C ITEM
Depressed Mood (sadness, hopeless, Helpless, worthless):
 0 - Absent.
 1 - Indicated only on questioning (*occasional, mild depression*)
 2 - Spontaneously reported verbally (*persistent, mild to moderate depression*)
 3 - Communicated non-verbally, i.e., facial expression, posture, voice, tendency to weep (*persistent, moderate to severe depression*)
 4 - VIRTUALLY ONLY those feeling states reported in spontaneous verbal and non-verbal communication (*persistent, very severe depression, with extreme hopelessness or tearfulness*)
Mood (Sad):
 0 - Does not feel sad
 1 - Feel sad less than half the time

- 2 - Feels sad more than half the time
- 3 - Feels intensely sad virtually all of the time

Reactivity of Mood:

0 - Mood brightens to normal level and lasts several hours when good events occur

- 1 - Mood brightens but does not feel like normal self when good events occur
- 2 - Mood brightens only somewhat with few selected, extremely desired events
- 3 - Mood does not brighten at all, even when very good or desired events occur

Outlook (Future):

- 0 - Views future with usual optimism
- 1 - Occasionally has pessimistic outlook that can be dispelled by others or events
- 2 - Largely pessimistic for the near future.
- 3 - Sees no hope for self/situation anytime in the future

IF SCORED 1-4 ABOVE, ASK: How long have you been feeling this way?

Have you been putting yourself down this past week, feeling you've done things wrong, or let others down? IF YES: What have your thoughts been? Has this been more than is normal for you?

In the past week, how have you felt about yourself?

Have you noticed your self-esteem has been down in the past week? How would you rate your worth as a person compared to others?

Have you been feeling guilty about anything that you've done or not done? What about things that happened a long time ago?

Do you feel like you're being punished?

Have you thought that you've brought (THIS DEPRESSION) on yourself in some way?

(Have you been hearing voices or seeing visions in the last week? IF YES: Tell me about them.)

HAMD ITEM IDS-C ITEM

Feelings Of Guilt:

- 0 - Absent.
- 1 - Self-reproach, feels he/she has let people down (*or guilt over decreased productivity only*)
- 2 - Ideas of guilt or rumination over past errors or sinful deeds (*feelings of guilt, remorse, or shame*)
- 3 - Present illness is a punishment. Delusions of guilt (*severe, pervasive feelings of guilt*)
- 4 - Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations

Outlook (Self):

- 0 - Sees self as equally worthwhile and deserving as others
- 1 - Is more self-blaming than usual
- 2 - Largely believes that he/she causes problems for others
- 3 - Ruminates over major and minor defects in self

This past week, have you had thoughts that life is not worth living? What about thinking you'd be better off dead or wishing you were dead? Have you had thoughts of hurting or killing yourself?

IF YES: What have you thought about?

How often do these thoughts come? How long do they stay? Have you thought of a plan in the last week?

Have you done anything to try to hurt yourself or taken any steps toward ending your life?

HAMD ITEM IDS-C ITEM

Suicide:

- 0 - Absent.
- 1 - Feels life is not worth living
- 2 - Wishes he/she were dead or any thoughts of possible death to self
- 3 - Suicidal ideas or gesture
- 4 - Attempts at suicide

Suicidal Ideation:

- 0 - Does not think of suicide or death
- 1 - Feels life is empty or is not worth living
- 2 - Thinks of suicide/death several times a week for several minutes
- 3 - Thinks of suicide/death several times a day in depth, or has made specific plans, or attempted suicide

What were your usual hours of going to sleep and waking up, before this began?

When have you been falling asleep and waking up over the past week?

Have you had any trouble falling asleep at the beginning of the night? (Right after you go to bed, how long has it been taking you to fall asleep?) How many nights this week have you had trouble falling asleep?

HAMD ITEM IDS-C ITEM

Insomnia Early (Initial Insomnia):

- 0 - No difficulty falling asleep
- 1 - Complains of occasional difficulty falling asleep (*i.e., 1/2 hour or more, 2-3 nights*)
- 2 - Complains of nightly difficulty falling asleep (*i.e., 1/2 hour or more, 4 or more nights*)

Sleep Onset Insomnia:

- 0 - Never takes longer than 30 minutes to fall asleep.
- 1 - Takes at least 30 minutes to fall asleep, less than half the time
- 2 - Takes at least 30 minutes to fall asleep, more than half the time
- 3 - Takes more than 60 minutes to fall asleep, more than half the time

During the past week, have you been waking up in the middle of the night?

IF YES: Do you get out of bed?

What do you do? (Only go to the bathroom?)

When you get back in bed, are you able to fall right back asleep?

How long do you stay awake?

How many nights this week have you had that kind of trouble?

(IF NO INSOMNIA) Has your sleep been restless or disturbed some nights?

HAMD ITEM IDS-C ITEM

Insomnia Middle:

- 0 - No difficulty
- 1 - Complains of being restless and disturbed during the night (*or occasional, i.e., 2-3 nights difficulty, 1/2 hour or more*)
- 2 - Waking during the night - any getting out of bed (*except to void*); (*often, i.e., 4 or more nights of difficulty, 1/2 hour or more*)

Mid-Nocturnal Insomnia:

- 0 - Does not wake up at night
- 1 - Restless, light sleep with few awakenings
- 2 - Wakes up at least once a night, but goes back to sleep easily
- 3 - Awakens more than once a night and stays awake for 20 minutes or more, more than half the time

How have you been spending your time this past week (when not at work)?

Is that normal for you?

Have you felt interested in doing (THOSE THINGS), or do you feel you have to push yourself to do them?

How would you describe your level of interest and motivation to complete daily activities?

Have you stopped doing anything you used to do? (What about hobbies?) IF YES: Why?

About how many hours a day do you spend doing things that interest you?

Is there anything you look forward to?

Have you had any fun this past week? (IF NO), Has there been anything you enjoyed (meal, movie, spending time with friends)? (IF YES), was the enjoyment you experienced at a normal level for you?

IF WORKING (IN OR OUT OF THE HOME): Have you been able to get as much (work) done as you usually do?

HAMD ITEM IDS-C ITEM

Work and Activities:

- 0 - No difficulty
- 1 - Thoughts and feelings of incapacity, fatigue or weakness related to activities, work or hobbies (*mild reduction in interest or pleasure; no clear impairment in functioning*)
- 2 - Loss of interest in activity, hobbies or work – by direct report of the patient or indirect in listlessness, indecision and vacillation (*feels he/she has to push self to work or activities; clear reduction in interest, pleasure, or functioning*)
- 3 - Decrease in actual time spent in activities or decrease in productivity (*Profound reduction in interest, pleasure, or functioning*)
- 4 - Stopped working because of present illness (*unable to work or fulfill primary role because of illness, and total loss of interest*)

Involvement:

- 0 - No change from usual level of interest in other people and activities
- 1 - Notices a reduction in former interests/activities
- 2 - Finds only one or two former interests remain
- 3 - Has virtually no interest in formerly pursued activities

Pleasure/Enjoyment (exclude sexual activities):

- 0 - Participates in and derives usual sense of enjoyment from pleasurable activities
- 1 - Does not feel usual enjoyment from pleasurable activities
- 2 - Rarely derives pleasure from any activities
- 3 - Is unable to register any sense of pleasure/enjoyment from anything

How has your concentration been in the past week? Were you able to focus on what you were doing (like reading or watching TV)? Did you notice that minor decisions were more difficult to make than usual (what to wear, eat, watch on TV)?

HAMD ITEM IDS-C ITEM

Concentration/Decision Making:

- 0 - No change in usual capacity to concentrate and decide
- 1 - Occasionally feels indecisive or notes that attention often wanders
- 2 - Most of the time struggles to focus attention or make decisions
- 3 - Cannot concentrate well enough to read or cannot make even minor decisions

Appendix B

SEASONAL PATTERN ASSESSMENT QUESTIONNAIRE

1. Name _____ 2. Age _____

3. Place of birth - City / Province (State) / Country _____

4. Today's date _____
Month Day Year

5. Current weight (in lbs.) _____

6. Years of education Less than four years of high school

- 1. Less than four years of high school
- 2. High school only
- 3. 1-3 years post high school
- 4. 4 or more years post high school

7. Sex - Male 1 Female 2

8. Marital Status

- Single 1
- Married 2
- Sep./Divorced 3
- Widowed 4

9. Occupation _____

10. How many years have you lived in this climatic area? _____

The purpose of this form is to find out how your mood and behaviour change over time.

Please fill in all the relevant circles. Note: We are interested in your experience; not others you may have observed.

11. To what degree do the following change with the seasons?

No Slight Moderate Marked Extremely
Change Change Change Change Marked
Change

- A. Sleep length 0 1 2 3 4
- B. Social activity 0 1 2 3 4
- C. Mood (overall feeling of wellbeing) 0 1 2 3 4
- D. Weight 0 1 2 3 4
- E. Appetite 0 1 2 3 4
- F. Energy level 0 1 2 3 4

INSTRUCTIONS

* Please circle the number beside your choice.

Example:

Sex Male 1 Female 2

12. In the following questions, fill in circles for all applicable months. This may be a single month O, a cluster of months, e.g. O O O , or any other grouping.

At what time of year do you...

- A. Feel best O O O O O O O O O O O O O O
- B. Gain most weight O O O O O O O O O O O O O O
- C. Socialize most O O O O O O O O O O O O O O
- D. Sleep least O O O O O O O O O O O O O O
- E. Eat most O O O O O O O O O O O O O O
- F. Lose most weight O O O O O O O O O O O O O O
- G. Socialize least O O O O O O O O O O O O O O
- H. Feel worst O O O O O O O O O O O O O O
- I. Eat least O O O O O O O O O O O O O O
- J. Sleep most O O O O O O O O O O O O O O

14. How much does your weight fluctuate during the course of the year?

- 0-3 lbs 1
- 4-7 lbs 2
- 8-11 lbs 3
- 12-15 lbs 4
- 16-20 lbs 5
- Over 20 lbs 6

15. Approximately how many hours of each 24-hour day do you sleep during each season? (Include naps)

- Winter 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Over18
- Spring 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Over18
- Summer 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Over18
- Fall 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Over18

16. Do you notice a change in food preference during the different seasons?

- No 1
- Yes 2 If yes, please specify :

17. If you experience changes with the seasons, do you feel that these are a problems for you?

- No 1
- Yes 2 If yes, is this problem -

- Mild 1
- Moderate 2
- Marked 3
- Severe 4
- Disabling 5

ACKNOWLEDGEMENTS

I would like to thank Dr. Kalkstein for all her help and encouragement.