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Exploring active video games (AVGS) as an intervention promoting wellbeing as it relates to depression

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Exploring active video games (AVGS) as an intervention promoting wellbeing as it relates to depression

Abstract

Depression and anxiety are the two most common forms of mental illness that affect people in the U.S. Great strides have been made over the years in improving the mental health of persons with these and other forms of mental illness. Although newer medications such as SSRIs can greatly enhance one's quality of life, there are lifestyle behaviors such as exercise and meaningful engagement in activities that have also purported similar positive outcomes. A challenge for health care providers is how to motivate mental health patients to change their behaviors, especially considering the apathy and passivity, typically associated with the illness, may have affected one's ability to initiate such activities.

A novel approach to encourage physical activity could be the use of active video games (AVGs) such as the Xbox Kinect. The advantages of applying video game technology are that it allows active participation on an inpatient unit, and allows portability once a patient is discharged to the community. In addition; if the movement were also associated with a meaningful activity that provides intrinsic satisfaction, then there would be a greater motivation to continue the behavior beyond the institutional setting. This paper is a summary of related research to the use of active video games in the treatment of people with depression and anxiety. Suggestions for the future application of active video games are also provided.

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Running Head: AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

EXPLORING ACTIVE VIDEO GAMES (AVGS) AS AN INTERVENTION
PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

By

Dania Berjaoui

A Senior Thesis Submitted to the

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AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Table of Contents

Abstract.....	3
Introduction.....	4
Advantages of AVGs in an Institutional Environment.....	7
Personal Interest.....	8
Well-Being, Mental Illness and Depression.....	10
Stigmas to Mental Illness.....	10
Depression’s effect on personal wellbeing.....	12
Current Treatment of Depression.....	13
Pharmacotherapy.....	13
Psychotherapy.....	15
Neuromodulation	17
Exercises Effect on Depression.....	20
Meaningful Leisure and its Effect on Depression.....	21
Active Video Gaming.....	24
Limitations to Xbox Kinect.....	35
Suggested Applications.....	35
Conclusion.....	38
Acknowledgements.....	39
Referenccs.....	40
Appendix A.....	45
Appendix B.....	46
Appendix C.....	47

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Abstract:

Depression and anxiety are the two most common forms of mental illness that affect people in the U.S. Great strides have been made over the years in improving the mental health of persons with these and other forms of mental illness. Although newer medications such as SSRIs can greatly enhance one's quality of life, there are lifestyle behaviors such as exercise and meaningful engagement in activities that have also purported similar positive outcomes. A challenge for health care providers is how to motivate mental health patients to change their behaviors, especially considering the apathy and passivity, typically associated with the illness, may have affected one's ability to initiate such activities.

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AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Introduction

Depression is a common mood disorder that has been found to affect a person's wellbeing. The characteristics of depression can vary significantly depending on the person. One symptom that is associated with depression is an underlying tone of sadness which follows a person everywhere they go. Another typical symptom of depression could be a persistent overwhelming sadness, where the person experiencing this feels there is no hope and is in constant despair. Other typical characteristic features of depression include the feeling of anhedonia (inability to feel pleasure), agony, misery, loss of interest in ordinarily enjoyable events, difficulty concentrating, loss of intrinsic and extrinsic motivation, and anxiety. Anxiety is often a part of this mood disorder and is frequently in the forefront of it (Mayer-Gross, 1954). For the purpose of this paper, when referring to depression, it should be assumed that the symptom of anxiety is included in the context of this disorder.

Throughout a lifetime, the rate of recurrence in all populations of depressed patients is exceptionally high (75-80%): about 15% of patients develop chronicity (depressive episode lasting longer than 2 years), and another 10-20% commit suicide (Angst, Kupfer, & Rosenbaum, 1996). There are a vast number of interventions that seem to have positive outcomes in the treatment of depression: these include pharmacotherapy, psychotherapy, and neuromodulation. Psychotherapies might take the form of cognitive-behavioral therapy (CBT) and interpersonal psychotherapy (IPT). Pharmacotherapy includes antidepressant medications such as selective serotonin reuptake inhibitors (SSRIs), or monoamine oxidase inhibitors (MAOIs). Electroconvulsive therapy (ECT) is

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

an example of a form of neuromodulation where a brief electrical pulse is applied to the scalp. These treatments will be discussed further in this paper.

There are advantages and disadvantages that are associated with these interventions as there are with most types of treatments. It makes sense that if a patient does not respond well to one intervention they may respond better to another. Despite the variety of treatments available, studies have shown there are still significant numbers of depressed people that do not entirely respond to these interventions; and there is not much empirical guidance on the options they have (Hollon, Thase, & Markowitz, 2002). Patients who do respond may also have the additional problem of coping with negative side effects of the medications, which makes pharmaceutical treatment a less desirable option for many individuals.

The need for other effective treatment is apparent. There are less intrusive interventions that can be considered. Physical activity and meaningful leisure activity are two that are worth exploring.

On order for man to succeed in life, god provided him with two means, education and physical activity. Not separately, one for the soul and the other for the body but for the two together. With these two means, men can attain perfection (Plato, fourth century BC).

The above quote describes the importance of balance in order to achieve personal wellbeing. It is imperative that a person incorporates physical activity and leisure into their daily routines. In society today, it is increasingly difficult to incorporate physical activity into an average American lifestyle. The average lifestyle might consist of the typical 40 hour work week: cooking for the family, cleaning the house, managing

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

finances, school sporting events, grocery shopping, and activities of daily living.

Everyone can dramatically improve his or her quality of life just by participating in a moderate amount of leisurely physical activity. Aside from the physical benefits, such as the reduction of coronary heart disease, hypertension, colon cancer, and diabetes mellitus; physical activity also improves mental health (CDC, 1996). Physical activity alone shows an inverse relationship between exercise and depression (Kritz-Silverstein, Barrett-Connor, & Corbeau, 2001; Strawbridge, Deleger, Roberts, & Kaplan, 2002). Just participating in about 21 minutes of moderate exercise has shown to significantly impact levels of anxiety (Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991), a symptom associated with depression, and maintain mental health.

When examining the significance of meaningful activity as it relates to a person's wellbeing and mental health, leisure can serve many purposes such as distraction, anticipation, and confrontation. Utilizing distraction, anticipation, and confrontation can improve motivation, self-efficacy, and intrinsic satisfaction, which are in opposition to the characteristics of the apathy and passivity commonly associated with depression and other mental health problems. In short, meaningful activity associated with leisure can dramatically impact a person's wellbeing.

Physical fitness and meaningful leisure clearly illustrate the importance they have to personal and mental wellbeing. Applying these together as interventions could be extremely beneficial to increasing the quality of life of a person while decreasing the symptoms of a mental illness such as depression. A novel approach to encourage both physical fitness and meaningful leisure could be the use of active video games (AVGs). AVGs present us with an innovative intervention, which positively addresses the

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

problems associated with depression. Incorporating active video games into someone's everyday life-style, especially as part of their leisure, might play a significant factor into their wellbeing.

Advantages of AVGs in an Institutional Environment

When a patient is hospitalized in a psychiatric setting, there are many barriers that are associated with being in a hospital that patients may encounter. The setting in which they are hospitalized might not be aesthetically pleasing. The programming of the unit may not allow for patients to participate in meaningful activity or exercise, due to various reasons such as legal restrictions, program structure, facility availability, or staff shortages. Patients might feel that the staff sees them as intellectually inferior or that staff is patronizing them. Patients might also feel that the environment does not meet their needs.

Patients who are admitted to an inpatient psychiatric setting can greatly vary in age. Designing a program that is generally accepted by all persons poses an obvious challenge. This leaves professionals such as recreational therapists constantly searching to find better approaches to meet the needs of their patients. A Certified Therapeutic Recreation Specialist (CTRS) that has used AVGs revealed that AVG technology is attractive to younger and older patients alike (K. Hoelscher, personal communication 1, March 18th, 2013). The variability of games that are utilized by AVGs allows patients to choose from a wide variety of options. An occupational therapist that is also familiar with AVGs was interviewed for this paper; she spoke about the importance of being able to utilize a device that can virtually provide a sense of any recreational activity, even in a restricted setting. She stated that, "Having an AVG is a marvelous addition on to our

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

program and on our unit. We allow patients to go to the gym/ on a fitness walk when they are able to leave the unit. However, at any given time there are many patients who are not able to leave the unit, either because of their legal status or their medical status. We try to capture these people in a movement group, but not everyone is appropriate for such a group, or likes its structure. Active video games allow for active movement that provides not only an outlet for exercise, but also, hopefully, some fun” (L. Singer, personal communication 2, March 15th, 2013). For example, patients who enjoy bowling would not need to leave the facility, but could experience the sport of their choice right at bedside. This also means that, if a patient wants to go bowling because that is something they really enjoy doing when they are not in the hospital, then they have the ability to go bowling. Patients will also have the opportunity to dance, play tennis, or participate in the many different games that are available through an AVG. Being in a hospital can be boring and quite sad for patients. It is important to have something that will bring enjoyment to people in an innovative and leisure interest based way.

Personal Interest

During my sophomore year of college while performing fieldwork with the PM&R department (Physical Medicine and Rehabilitation) in a hospital, I witnessed the use of modern day technology in ways I had never seen before. The technology they were using included many different items such as adapted computer keyboards, adapted computer inputs-such as using a big round button to press a certain keyboard key, and magic screens. Some of these devices were only specific to physical rehabilitation, and although most of these devices were unfamiliar to me, there was one device that I noticed I had played before, this being the Nintendo Wii. The patients who were using the Wii on

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

the PM&R unit included patients that had various physical impairments due to multiple causes such as a stroke or amputation. Using the Wii for therapy allowed the therapist to design a treatment plan for a patient that incorporated fun and one's leisure interest. This created a great tool for therapists to work on range of motion or balance activities with these patients who were also intrinsically motivated to participate.

Some time passed after that experience, and I began to see commercials for a new device called the Xbox Kinect. Shortly after this device came out, I had the opportunity to play it. When I played the Xbox Kinect, it was rare to see that I did not smile or laugh. While playing sports games on the Xbox Kinect like football, I often found myself sweating and panting, and at other times as when I was playing pop darts, I was calm and focused. After playing the Xbox Kinect, I was typically in a better mood. This validated my interest in discovering the cause of these psychological benefits. Did I feel better because of the exercise, the enjoyment of the activity, or both? So with my interest sparked, I wanted to explore the relationship between exercise and leisure enjoyment, and how that related to depression and a person's wellbeing.

My whole academic life I have had an interest in exercise and psychiatry, specifically depression. Throughout my studies, I have learned a good way to counteract the side effects of depression is to exercise. I wondered if using AVGs, such as the Xbox Kinect, might be beneficial to the population suffering from depression. For me, depression and personal wellbeing is a spot that hits home. One of my very close friends was diagnosed with depression, and is constantly battling the various side effects that it comes with. There were days when all she did was lie in bed; she did not shower, eat, or take care of herself. This resulted in her getting very sick and being admitted to a

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

psychiatric hospital. After my friend was discharged from the hospital, treatment was not much fun for her. I didn't completely understand what she meant. She explained that most of her treatment included drugs (which she hated) and outpatient therapy. She said she wished there was something that she could do that was enjoyable, that didn't make her feel like she was being forced to do something. This is what gave me the idea of using the Xbox Kinect as a treatment for depression as it relates to a person's wellbeing.

LITERATURE REVIEW

Well-Being, Mental Illness and Depression

One in two people will have a personal or interpersonal experience with a psychiatric condition over a lifetime. Therefore, half of us at some point in our lives will be in contact with mental illness; whether as a personal diagnosis, or knowing someone that is suffering from a mental illness (Jorm et al., 1997; Kessler, McGonagle, & Zahorik, 1994). Given the magnitude of people impacted by this, it would seem logical that the exposure would translate to an accurate understanding of mental illness. If half of the population will be impacted by a psychiatric condition throughout their lifetime, identifying how most people view these diagnoses is important, especially because mental illness plays a significant role in a person's wellbeing.

Stigmas to Mental Illness

When a person thinks of a mental illness, what is the first thing that typically comes to mind? Surprisingly, a public opinion survey found that a person who has identifiable signs of a mental illness was often viewed as experiencing a psychosocial event like a life crisis, rather than a mental illness. This has especially been found true for

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

depression. Only 42% of people who took this survey were able to accurately recognize depression by its actual symptoms (Lauber, Falcató, Nordt, & Rossler, 2003).

A study reported by the Journal of Mental Health found that there were often three factors concerning people's perceived perception of the etiology of depression (Goldstein & Rosselli, 2003). These included biological factors, psychology/personality factors, and environmental factors. The biological model focused on hormone imbalance, biological changes in the brain or nervous system, and genetics or inherited predispositions. The psychology/ personality factor model focused on more personality--based reasoning such as the will power of a person, optimistic/pessimistic outlooks, and learned helplessness and hopelessness. Finally, the environmental factors model represented life traumas or events, or ones personal expectations (Goldstein & Rosselli, 2003).

While some beliefs about the etiology of depression might have some accuracy, some of the inaccurate impressions pose a significant problem for the mental health population affected by these diagnoses. Inaccurate beliefs about the causes of mental illness, especially depression and anxiety, cause a stigma in our society. These stigmas could potentially influence the decision of a person with depression or anxiety to seek or not seek treatment. When a person with a mental illness does not seek treatment or even identify that there is a problem at hand, the wellbeing and quality of life of that person is affected. There are collaborative efforts around our society that have begun to educate people about the true causes of depression, so that the importance of these problems are not diminished and stereotyped.

Depression's Effect on Personal Wellbeing

Depression and anxiety as a diagnosis stand among all others as the most dominant psychiatric conditions around us (Rouillon, 1999). In fact, as cited by the World Health Organization, by 2030, depression will take the number one spot of the global disease burden, even above diagnoses such as heart disease, stroke and HIV/AIDS (Chen, Stevinson, Po-Wen, Chang, & Chu, 2012). The severity of depressions can range from mild mood disturbances to psychotic intensities (Hollon et al., 2002). Psychological symptoms of depression can include dysphoric mood accompanied by loss of pleasure and interest, suicidal thoughts, loss of energy, poor self-care, social withdrawal, feelings of self-reproach, negative beliefs about one's self, etc. (Hollon et al., 2002; Weissman, 1979). Vegetative symptoms include sleep and appetite disturbance and loss of libido (Hollon et al., 2002). Physiological symptoms can also be seen in depression. Physiological symptoms include a general feeling of languor, the feeling of a constant band around the head, a heavy weight--like pressure on the chest, heaviness of limbs, interrupted sleep, loss of appetite, and gastrointestinal problems. These physical symptoms are often expressed as a general pain that cannot be targeted to a specific area (Mayer-Gross, 1954). The consequences of these symptoms are severe and may include loss of independence, personal and family suffering, work productivity, marital dilemmas, and even an increased risk for cardiovascular disease (CVD) and diabetes. (Katon, Lin, Russo, & Unutzer, 2003; Rozanski, 2012; Wittchen, Bessdo, Bittner, & Goodwin, 2003). The symptoms just described could impair a person so much that the very life they live is altered significantly. A person could feel that they were so tired, or in so much pain, that their performance of activities of daily living (ADLs) and

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

instrumental activities of daily living (IADLs) could be impacted to the point where the patient is not completing them at all. Considering all the symptoms and the devastating consequences of depression to a person, the wellbeing of a person can be significantly impacted by this diagnosis as it can impair social and personal functioning (Weissman, 1979).

Current Treatment of Depression

With diagnoses that can severely impair the functionality of one's life in a way that is detrimental to their wellbeing, it is especially important to look at the current approaches we are utilizing to reduce the effects of these problems. There are multiple different approaches that are being used in the treatment of depression which include pharmacotherapy, psychotherapy, and neuromodulation. This paper will emphasize the most widely used and accepted treatments.

Pharmacotherapy

The neurotransmitters norepinephrine, serotonin, and dopamine are all neurotransmitters that have been found to have an affect on the regulation of mood in depression, sleep, libido, pain, and appetite. It is when these neurotransmitters do not function properly that the normal balance is disrupted and there is a disruption in the signals between neurons: this is when you might see that depression is present. There are multiple classes of antidepressant medications that are used today, which are roughly comparable in efficacy. MAOIs, TCAs and SSRIs are examples of these medications (Mayer-Gross, 1954).

MAOIs were one of the first antidepressants to be identified. MAOIs work well for atypical or reversed vegetative symptoms (Thase, Trivedi, & Rush, 1995). These

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

medications work by “inhibiting the action of monoamine oxidase (an enzyme that breaks down the neurotransmitters in the presynaptic neuron), thus leaving more transmitters available to transmit impulses across the synapse” (Hollon et al., 2002). MAOIs are typically not the first class of medication that is used for treatment of depression. Despite having a clear effect on patients who might not respond to the more conventional medications, MAOIs can cause life threatening allergic reactions with common foods like aged cheese (Thase et al., 1995). TCAs were used as a first-line antidepressant in the 1960s and 1970s; they either inhibit the norepinephrine reuptake or inhibit both the norepinephrine and serotonin reuptake. These medications were once thought to only affect serotonin; but in fact, they each have metabolites that affect both serotonin and norepinephrine (Thase & Kupfer, 1996). The side effects of these medications and the potential ease of lethal overdose are drawbacks for the hesitancy in use (Hollon et al., 2002). SSRIs are now the most widely prescribed medicine. “The immediate actions of SSRIs are mostly side effects, and may be mediated by the initiating actions of SSRIs, namely negative allosteric modulation of the serotonin transporter” (Stahl, 1998). Although SSRIs also have side effects, they are typically the least problematic when compared to the other classes of medications.

To summarize, all of the classes of medications described are comparable in their efficacy. The SSRIs are the least problematic, but might be less effective than TCAs for patients that suffer from severe depressions. The MAOIs are not often used as first-line treatment, but are used to treat depressions that are atypical and do not respond to other medications. Discontinuation of a medication does not guarantee that the medication will reduce the risk of depression once discontinued. Typically, patients who do not respond

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

to a particular medication, or like a medication that they are on, can be switched between two different medications or combinations of these medications. Since the variety of side effects differs for everyone, it is often difficult to find a treatment regimen that will be constantly effective. (Hollon et al., 2002).

Psychotherapy

Depending on the needs of an individual, psychotherapy might be a good option for a person that is suffering from a mood disorder like depression. Psychotherapy can take many forms including group therapy, family therapy, couples therapy, or individual therapy. Typically in psychotherapy, a trained mental healthcare professional (a social worker, occupational therapist, recreational therapist, psychiatrist or counselor) helps bring about positive changes in thoughts, feelings, and behaviors of a patient via talking with that patient to help them realize problems and possible causation. The aim of psychotherapy is to help individuals resolve conflicts that are a factor in their depression. This might include: resolving conflict, improving social relationships at work or with family, recovering from a loss or trauma, and how to manage with persistent stressors. In this paper, evidence--based treatments such as cognitive-behavioral therapy (CBT) and interpersonal psychotherapy (IPT) will be discussed.

CBT occurs when a trained or licensed therapist leads an individual session or group with patients that suffer from depression. CBT seeks to assist clients in identifying how they feel, while specifically focusing on their mood thoughts and actions. The goal is to help patients understand how their individual responses, thought process, and behavior can impact their emotions. Individual work focusing on the material taught in the therapy session is assigned to the client to help clients practice their new CBT skills on a daily

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

basis, and assist the therapeutic process (Dennison & Moss-Morris, 2010). According to the University of Michigan Depression Center, CBT helps to

Identify and correct the inaccurate thoughts that may precede depressed feelings. Since people with depression often experience distorted, negative thoughts about themselves or their situations, working to recognize more accurate information about the patient's experience can help individuals gain a more realistic picture of the present and the future (Regents of the University of Michigan, 2010).

Examples of worksheets that a therapist might give to a patient in CBT to identify unhelpful thinking styles are attached (Figure 1 and Figure 2). Since CBT aims to help structure the lives of patients with skills that they can use for the rest of their life, worksheets provide good practice for the patients.

IPT focuses on the idea that the psychological symptoms that a person is experiencing are closely connected with interpersonal distress. The interpersonal triad includes the following: the acute interpersonal crisis (stressor), bio-psychosocial vulnerability (diathesis), and social support (context). This examines how all of the previously mentioned aspects of the interpersonal triad play a direct relationship to one another. Interpersonal distress may be linked to the depressive psychological symptoms one is having. These stressors might not be the actual cause of the depression, but they may contribute to the severity or the onset of it. Interpersonal interactions that might be considered stressors include disputes with others, a divorce or break-up, or grief and loss. How a person reacts to these stressors is based on a patient's diathesis such as a person's personality, temperament, and attachment style. A person's diathesis can affect the

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

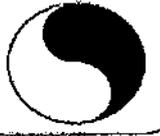
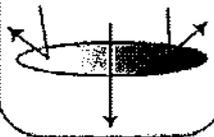
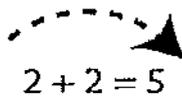
impact a stressor can have on them based on their social support. Social support can influence the individual's ability to cope with other aspects of the triad. In IPT all these factors are addressed hoping to help a patient understand why these past interactions were important, and how they can improve their interpersonal relationships and social support in the present (Stuart, 2008).

Neuromodulation

One of the neuromodulation methods that are commonly used to treat multiple brain illnesses, including depression, is electroconvulsive therapy (ECT). ECT is often used in depressed patients who do not respond well to other types of treatment, or have a difficult time tolerating the side effects of medications. ECT is also used in other instances in mental health, such as extreme episodes of mania or psychotic episodes associated with schizophrenia (The Regents of the University of Michigan, 2011). ECT "Involves applying a brief electrical pulse to the scalp through electrodes while the patient is under anesthesia. This pulse excites the brain cells, causing them to fire in unison, and produces a seizure" (The Regents of the University of Michigan, 2011). The number of ECT treatments that a person typically receives can range from approximately six to twelve sessions. The ECT treatment team determines the amount of sessions a patient needs. Side effects of ECT might include headaches, muscle aches, or nausea. A more significant side effect can include memory loss (The Regents of the University of Michigan, 2011). ECT has some risks and many benefits; ultimately the choice is up to the patient to make the best decision for him or herself when it comes to choosing a treatment.

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Unhelpful Thinking Styles

<p>All or nothing thinking</p>  <p>Sometimes called 'black and white thinking'</p> <p><i>If I'm not perfect I have failed</i></p> <p><i>Either I do it right or not at all</i></p>	<p>Over-generalising</p> <p><i>"everything is always rubbish"</i></p> <p><i>"nothing good ever happens"</i></p> <p>Seeing a pattern based upon a single event, or being overly broad in the conclusions we draw</p>
<p>Mental filter</p>  <p>Only paying attention to certain types of evidence.</p> <p><i>Noticing our failures but not seeing our successes</i></p>	<p>Disqualifying the positive</p>  <p>Discounting the good things that have happened or that you have done for some reason or another</p> <p><i>That doesn't count</i></p>
<p>Jumping to conclusions</p>  <p>There are two key types of jumping to conclusions:</p> <ul style="list-style-type: none"> • Mind reading (imagining we know what others are thinking) • Fortune telling (predicting the future) <p>$2 + 2 = 5$</p>	<p>Magnification (catastrophising) & minimisation</p>  <p>Blowing things out of proportion (catastrophising), or inappropriately shrinking something to make it seem less important</p>
<p>Emotional reasoning</p>  <p>Assuming that because we feel a certain way what we think must be true.</p> <p><i>I feel embarrassed so I must be an idiot</i></p>	<p>should</p> <p>must</p> <p>Using critical words like 'should', 'must', or 'ought' can make us feel guilty, or like we have already failed</p> <p>If we apply 'shoulds' to other people the result is often frustration</p>
<p>Labelling</p>  <p>Assigning labels to ourselves or other people</p> <p><i>I'm a loser</i></p> <p><i>I'm completely useless</i></p> <p><i>They're such an idiot</i></p>	<p>Personalisation</p> <p>"this is my fault"</p> <p>Blaming yourself or taking responsibility for something that wasn't completely your fault. Conversely, blaming other people for something that was your fault.</p>

PSYCHOLOGYTOOLS.org 

Figure 1. Example of CBT homework (Psychologytools.org)

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Belief-Driven Formulation

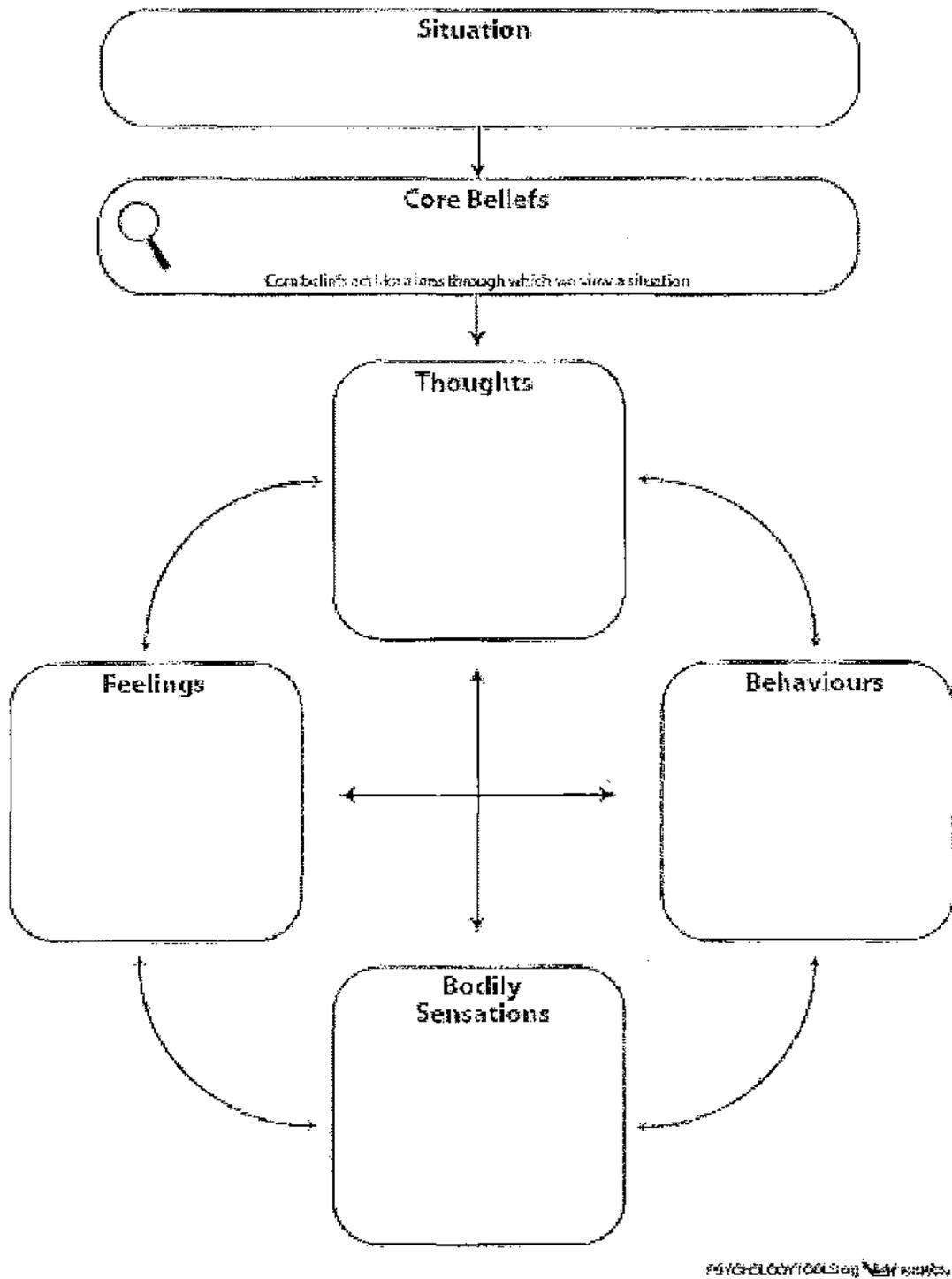


Figure 2. Example of CBT homework (Psychologytools.org)

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Exercise's Effect on Depression

With the amount of medications and treatments available regarding the treatment of depression, it is imperative that our society keep medical interventions simple. This might translate to approaches that are more prevention-based and self-care oriented. Depending on the severity of the depression, instead of instantaneously resorting to pharmacotherapy and even psychotherapy as a first resort, exercise might be a valuable treatment to consider. Using exercise as a method to alleviate or prevent depression would have considerable advantages on the wellbeing of a person, standing alone or alongside another form of therapy.

There is a growing amount of research that has been done on the effectiveness that physical activity has on depression. Physical activity on the body is linked to a wide range of health benefits. Without physical activity, the body is at an increased risk for coronary heart disease, diabetes, certain cancers, obesity and hypertension (CDC, 1996). Aside from physical benefits, research suggests that physical activity plays other roles in the wellbeing of a person. "It is generally accepted that physical activity may have positive effects on mood and anxiety" (Strohle, 2009). If physical activity is not integrated into someone's everyday lifestyle, then the lack of physical activity may affect the incidence of depression.

Many doctors are using exercise as an adjunctive treatment to psychotherapy and pharmacotherapy. There are various studies that support the theory that the level of physical activity someone exerts might be an important factor in their depressive symptoms. "Exercise reduces depression and anxiety, increases feelings of well-being, improves the ability to handle stress, and improves self-image" (Elrick, 1996). It is

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

important to promote physical activity in people because of the effect this can have on mental health, since poor functioning in either of these areas can cause possible impairments to a person. “Physical activity is one modifiable factor for which there is a growing evidence base for both protective and therapeutic effects across a range of physical and mental illness, with these benefits equally available for older people” (Chen et al., 2012). Therefore, “Identifying factors that contribute to preventing depression or alleviating symptoms in this population would have important implications for public health” (Chen et al., 2012). In a study conducted by Alameda County, men and women who participated in low levels of physical activity had a 70 percent increase of incidence of depression over a nine year period (Camacho, Roberts, Lazarus, Kaplan, & Cohen, 1991). Physical activity is extremely important because evidence has shown “exercise is as effective as psychotherapy and antidepressant therapy in treating mild-to-moderate depression, and even more effective when used in conjunction with the conventional therapies” (Nicholoff & Schwenk, 1995).

Meaningful Leisure and its Effect on Depression

Research suggests, “Leisure experiences affect the physical and mental health of an individual. Meaningful leisure activities have been shown to be an important source of the need of gratification” (Tinsley & Eldredge, 1995). The symptoms of depression can make people forget about all the enjoyable things that they may have participated in prior to experiencing their depressive episode. It is especially important for depressed patients to participate in activities that might help them remember that there are things that they can in fact enjoy. One of the approaches that leisure counseling in stress management uses is called the Therapeutic Remedial Approach. In leisure counseling, this approach is

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

said to be one of the most difficult challenges, especially when presented by difficult clients. Difficult clients include patients with various mood problems. As time goes on, these patients begin to lose an interest in everything. We must find a way to address this. In the following quote, the author talks about the effect of various mood and emotional disorders, and how using some sort of leisure intervention might alleviate some of their symptoms--reminding them of enjoyable activities they could participate in. The author also suggests that this is a very difficult task for mental health care workers to do without patience and perseverance.

Isolation, alcoholism, addiction, depression, impulse-neurosis, etc. – are great, but whose potentially and, perhaps crucially alleviating hobbies, activities and interests are minimal or non-existent. Matching highly appropriate leisure pursuits with deeply-rooted emotional or psychophysiological problems in a precise way as to distract attention from, minimize, marginalize, threaten, squeeze, drain or undermine the latter, is a therapeutic task requiring great persistence and judgment. Moreover, building, rebuilding and sustaining interests in those with low morale or expectations cannot be accomplished without maximum clinical patience and tenacity (Juniper, 2003).

The quote illustrates the importance of meaningful activity as a means of leisure into one's lifestyle. Leisure activity utilized by a person can be applied as an effective means of distraction. An example of distraction may include a stressed employee who comes home from work and loses himself in music for an hour. Another example could be a person suffering from tinnitus involving herself in a

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

simple, but challenging gardening activity that allows her to feel at ease for a few moments. These are effective distractions in action (Juniper, 2003). Anticipation is another technique that is utilized in leisure therapy and is an important all around aspect of leisure in general. Anticipation can almost be looked at as the “Yin and Yang” of a person’s life. It provides a sense of balance and equilibrium for them. When a person is able to look forward to something, they might be able to sustain a positive mood. Someone who is sitting through a horrible workday, but has planned to play cards with friends later might be able to use this meaningful activity to make it through the day. Another example may include a person who struggles with staying motivated through their classes, but knows that if they do finish well they will be able to travel out of the country to a place where they have always wanted to sight see. Again, giving someone something to look forward to that they can enjoy themselves in provides a great amount of comfort. Anticipation can happen either spontaneously or structured; both of these things help a person feel the attributes of perceived freedom and control. Confrontation is another form of leisure strategies that is used. This type of strategy is one of the hardest to understand. An example of a person using confrontation would be:

The role-adoptive employee whose activities in local politics bring him the prestige and authority so denied him in his everyday work, or the alcoholic woman, who takes up regular sessional swimming in an intuitive effort to curb her drinking, both lie within the wide spectrum of confrontation (Juniper, 2003).

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Confrontation allows a person to feel a sense of self-determination and causation, potentially allowing a person to have a rewarding feeling to the experience while improving their mood and decreasing the symptoms associated with their depression.

It is important that leisure is utilized in mental health, so that our patients have something to look forward to, or identify something that is enjoyable to them. It is difficult for someone with depression to feel a sense of enjoyment, and finding an enjoyable leisure activity gives them this opportunity. The need of a person to feel self-gratification, perceived freedom, and self-efficacy is made possible by meaningful activity. This meaningful activity provides a means to improve one's wellbeing.

Active Video Gaming

There are many different interventions that are currently utilized in the treatment of depression. As discussed, pharmacotherapy, psychotherapy and neuromodulation are effective means of treatment. Despite being appropriate and effective, these forms of treatment might have some negative features to them. With medication, the side effects are numerous; one of which includes that if medication is discontinued, it is not certain that the treatment will continue to be effective. Psychotherapy is also another form of therapy that has proven to be effective; although this type of therapy often also poses problems for patients who may not have the motivation or interest in doing some of the required homework that psychotherapy may incorporate in treatment. ECT is another efficient treatment for difficult to treat depression, but there is a great fear of this therapy, and like medications, it involves some side effects. Utilizing a treatment that a patient is driven to participate in can have many advantages. As discussed throughout this paper, the benefits of applying exercise and leisure together when addressing mental health and

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

a person's wellbeing are significant, and might be an effective means of treatment for patients with depression.

Active Video Gaming (AVG) introduces a different approach to therapy and is an intervention that can be utilized in many settings, including outpatient, inpatient, and home settings. Active video gaming introduces the concept of playing a game with one's body, using both physical movement and leisure based meaningful activity. AVGs are in opposition to traditional video gaming. They have a more sedentary approach, where the player does not need to do anything but sit in a chair or on a couch, and move their thumbs on a controller.

In health care, there has been increasing attention given to the use of AVGs as a therapeutic modality used to affect patients that suffer from vascular illness. There has been even more research demonstrating the effect of AVGs on increasing upper extremity function (Boian et al., 2002; Coobs et al., 2012), balance and mobility (Cho, Lee, & Song, 2012), and energy expenditure (Hurkmans, Ribbers, Streur-Kranenburg, Stam, & Berg-Emons, 2011). What has not been researched as extensively are the effects of these AVGs on the psychological states of patients who suffer from depression.

One study measured the variety of outcomes, including anxiety, among burn patients using an AVG. It found that these games were helpful as a temporary distraction that helped to decrease the overall feelings of anxiety and pain (Yohannan et al., 2012). Another study found that playing AVG games such as *Dance Central* and *Kinect Sports Boxing* increased energy expenditure by 150% and 263%, respectively. This suggests that participating in active video gaming regularly could prove to be effective in increasing

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

physical activity (Smallwood, Morris, Fallows, & Buckley, 2012). Although, this study was based on the responses of school children so the responses may differ in adults.

Some types of AVGs consoles include the Nintendo Wii and Xbox Kinect. The Nintendo Wii is an interactive gaming system. This active video game (AVG) is electronic media that allows players to actively interact with the game. The Wii is primarily operated with a handheld wireless controller, which players simulate movements with the controller in hand, and the players on the screen move in the same way (O'Donovan & Hussey, 2012). This allows the player to simulate an activity like swinging a golf club. The Xbox Kinect, unlike the Nintendo Wii, uses a motion sensor that includes skeletal tracking of a person standing in front of the sensor, which allows the person playing the game to interact using no controller. This technology requires the user to use not only hand and arm movement, as required by the Nintendo Wii, but forces the person to use their whole body (Smallwood et al., 2012).

For the purposes of this paper, I would like to focus on the Xbox Kinect, since it is a newer, more intricate technology. It does not require any hand held controllers for game play, and allows more of a full body experience. The Xbox Kinect now has many games that vary in different levels of physical exertion, according to the Microsoft Xbox website. Some of these games include: Sports games-- "Madden NFL 13", "Kinect Sports Ultimate", "Deca Sports Freedom", "Nicktoons MLB"; dance games-- "Dance Central 2", "Just Dance 3", "Michael Jackson The Experience"; Fitness-- "Zumba Rush", "Your Shape: Fitness Evolved 2012", "EA SPORTS Active 2", "UFC Personal Trainer"; family games-- "KINECT RUSH! Disney PIXAR Adventure", "Kung Fu Panda 2", "Sesame Street: Once Upon a Monster", "Kinectimals"; and action and adventure games-- "Kinect

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Star Wars”, “The Gunstringer”, “Rise of Nightmares”, “Twister Mania Xbox 360”

(<http://www.xbox.com/en-US/Kinect/Games>, 2013).

“Kinect Sports Ultimate Edition” is an AVG that has a diversity of activities in it, ranging from low exertion to high exertion activities. There is not much literature exploring the levels of physical exertion each of the games featured in “Kinect Sports Ultimate Edition” requires. Therefore, I have given a synopsis of each game and expressed my personal opinion on the physical exertion that is required to successfully play some of these games. I have used the BORG CR-10 scale to illustrate my perceived exertion of the games. The BORG CR-10 scale is a ratio scale with values from 1-10. This is a commonly used scale to measure perceived physical exertion levels. It is highly reliable with reported reliability co-efficients from 0.841 to 0.986 (see Appendix A) (Borg, 1985).

Soccer

In soccer, the user must run in place to make their character move. When playing offense, the player must make a kicking motion to pass the ball or shoot. When the user does not have the ball, they either must run in place to try and steal the ball from their opponent, or become the goalie by using their full body to block the shots that are kicked by the opponent. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 4.

Football

The game begins with a kickoff to one team. The team receiving the ball will have their character catch the ball and proceed to sprint toward the other team’s end zone, while their opponent tries to tackle them. The player with the ball can make a sharp cut to their

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

right or left to dodge tackles. When throwing the ball, the player imitates a throwing motion with the selected throwing arm and throws to another member of the team.

Indicator lights change colors when the other players are open. If a player is trying to score a field goal, the player uses his or her bottom extremities to imitate kicking the ball.

Based on the BORG CR- 10 scale my perceived physical exertion of this game was 9.

Golf

In golf players stand up to the tee and play nine holes of golf. They select the hand they would like to hold the golf club with, and players then imitate swinging the club. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 3.

Skiing

Skiing imitates downhill skiing. Players stand in place, tuck and lean to the left or right, and go through gates, and jump past huge jumps. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 4.

Tennis

The player is placed on a tennis court and given the ability to take an initial serve. The person playing the game uses his or her arms to make swinging motions, imitating hitting the ball with a racquet. The player is able to step forward to create a power shot. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 4.

Boxing

In boxing, the players use their upper extremities to punch and block the players they are competing against, either in the head or the body. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 7.

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Darts

Players imitate gestures used in darts by sticking their arm out in front of them and aiming at the desired spot they would like to hit. The players then pull back and flick the dart. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 1.

Baseball

Players have the ability to select what arm they would like to bat and pitch with. Players then swing towards a pitched ball and run in place towards base. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 4.

Bowling

Bowling takes place in a typical bowling alley scene, and the player has the ability to choose what hand they would like to use to throw the ball. The player uses the typical motions that are used in bowling by moving their arm back and forward; the player is also able to create topspin on the ball by moving their hand as they bowl across their body. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 5.

Track & Field

Track & Field has a collection of five different events. These events are Sprint, Javelin, Discus, and Hurdles. The players can play these individually or play them all in a pentathlon. Individually, each of the events requires multiple different things. When sprinting, the player must quickly imitate a running motion in place, bringing his or her knees as high as possible. The quicker and higher the player moves their knees, the faster the on-screen character will go. Based on the BORG CR- 10 scale, my perceived

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

physical exertion of this game was 9. In javelin, the player quickly sprints in place, and when he/she reaches the designated throw area, the player makes an upward throwing motion with their arm and throws the javelin. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 3. In discus, the player selects the hand he or she would like to use, twists their body sideways, and prepares to throw the discus. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 3. Finally, in hurdles, the player runs in place and sprints towards a hurdle; and when the approaching hurdle turns green, the player then jumps over the hurdle, clearing multiple hurdles to the finish line. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 9. If all these events are played together as a pentathlon, I would say that based on the BORG CR- 10 scale my perceived physical exertion of these games were 7.

Table Tennis

Table tennis requires players to pick what hand they would like to pick the paddle up with. In table tennis, the upper extremities are used to imitate hitting the ball. When the ball is hit in a particular way, it is possible to incorporate topspin, back spin and smash shots. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 3.

Beach Volleyball

Beach volleyball allows the player to serve and hit the ball with the upper extremities, block with the upper extremities even while jumping, or use any other part of their body to hit the ball to teammates. Based on the BORG CR- 10 scale my perceived physical exertion of this game was 7.

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Each of these games features mini-games within it to help the player improve their skill on the particular events. Player's scores are recorded and they are able to work on personal goals, or practice competitiveness. These sports all take place in different made up locations, and the graphics are vivid and pleasant. The ability of the Kinect sensor to track gross motor movements allows the game to give the players an opportunity to celebrate if they do well; at this time players may dance or perform some sort of movement that is then shown on the screen through the avatar. The variety of locations that these games take place in can range from a sports arena to outdoors in the wilderness. The sound effects of some of the games may be pleasing to hear, such as the sound of the waves hitting your raft. Just the area where these games take place can provide a means of distraction for the patients. The ability to see an avatar portraying your movements on the screen can be funny and make people laugh.

Some might say that what the Xbox Kinect has to offer is just like another video game and that there is really not much of a need for it. Despite what these people say there are many benefits to having this on a psychiatric unit. I interviewed some professionals in a large hospital that has used the Xbox Kinect as part of treatment and their feedback was extremely positive. A doctor on the unit spoke about an experience that helped him relate to a patient in a different way. He states: "I witnessed a psychotic patient become less internally preoccupied/ obsessive, and I was able to share a laugh and connect with him better than on regular interviews. It was nice to see a different side of a patient's emotional presentation outside the typical structured patient interview/hospital rounds" (D. Maixner, personal communication 3, March 13th 2013). Although this doctor spoke about the Xbox Kinect with a psychotic patient, it is important to look at the effect

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

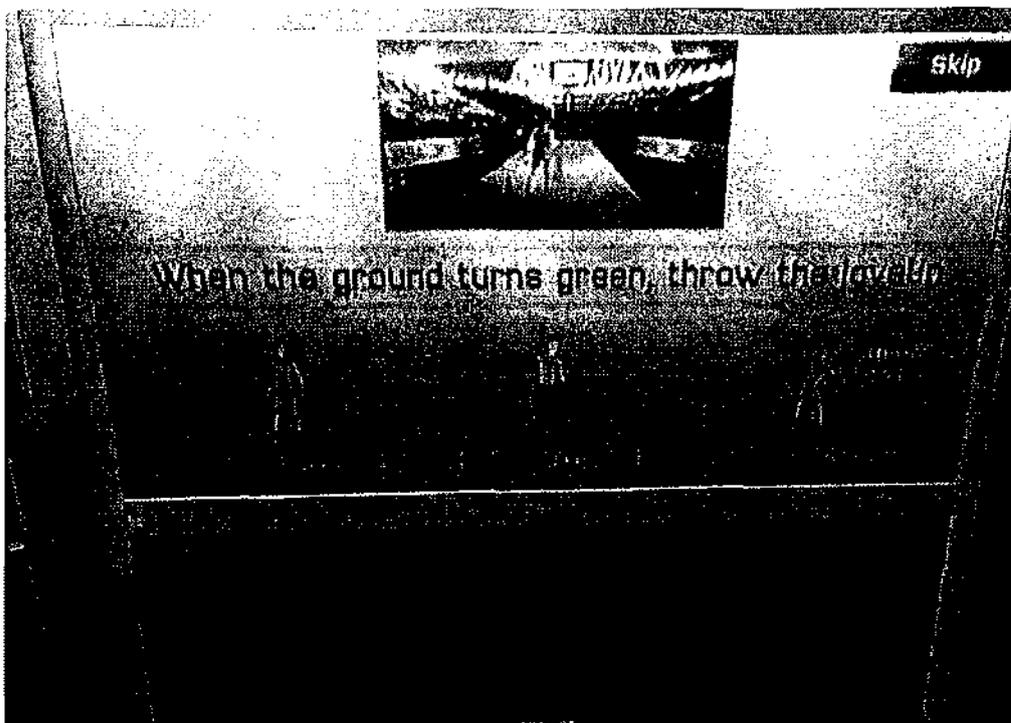
it had on the relationship between the professional, and the effect it had on the patient. Another doctor stated, “When we interview patients who have participated in exercise activities, we find that they report improvement in their mood. Exercise is an important part of a healthy and balanced lifestyle, so another benefit (apart from the patient reporting improvement while on the unit) is encouraging patients to incorporate exercise into their lives.” This physician also stated that when she witnesses patients playing the Xbox Kinect, “they appear engrossed in the activity, which suggests to me that they are at least temporarily distracted from their depressed mood or their problems” (O. Solis, personal Communication 4, March 13th, 2013). This type of improvement for a patient, just by playing an AVG, supports the importance of incorporating this into a psychiatric unit. Some of the great things about using an active video game for treatment can be the cost effectiveness of it. After making an initial purchase the user can enjoy the benefits of having this device to use whenever they would like. Other advantages of the Xbox Kinect are its accessibility and portability. If someone wanted to learn to use the Xbox Kinect they would easily be able to. The graphics that the device uses are vivid and clear, which allows for a realistic experience. Below (Figure 3- Figure 6) are some pictures I have taken of the Xbox Kinect and its features.

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Figure 3. Xbox Kinect skeletal tracking



Figure 4. Instructions to play Xbox Kinect game



AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Figure 5. Xbox Kinect Sports selection screen

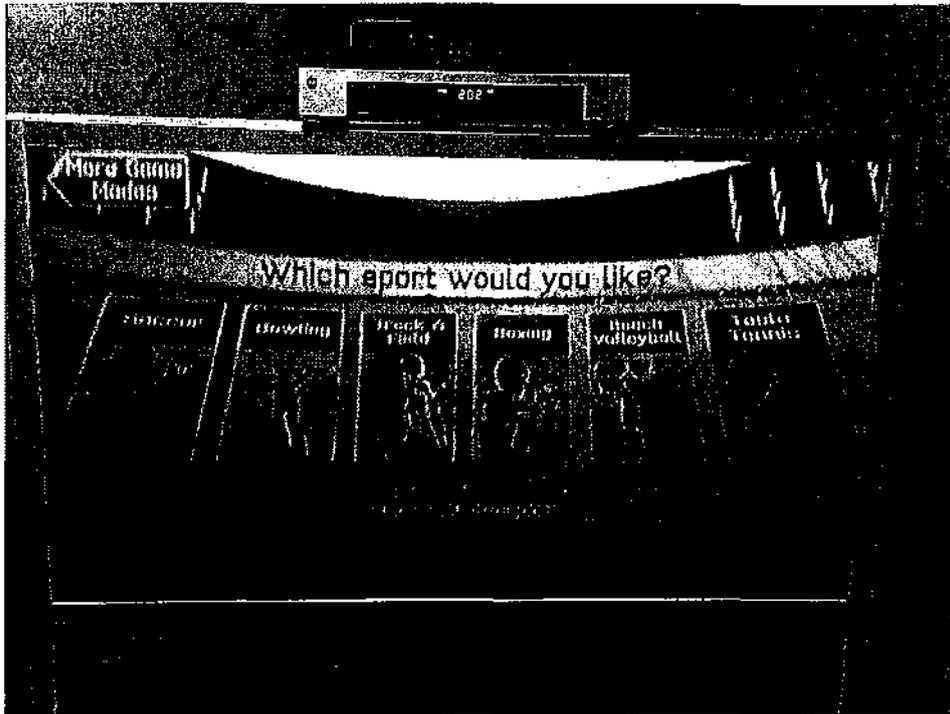


Figure 6. Xbox Kinect Sensor



AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Limitations to the Xbox Kinect

This is an ever-growing technology without much literature, and as time goes on the technology and literature will grow. Along with the good things, there are some limitations when it comes to using the Xbox Kinect. The announcer in the game can sometimes add a more competitive nature to the game, by teasing participants about how they are doing. The technology might not be reactive at times when a person is trying to activate the sensor. Another flaw is if a person is using the Xbox Kinect and another person steps in front of them, the sensor has some difficulties readjusting to the player.

While there still is a lot of room for development that might further justify the role the Xbox Kinect has on patients with depression and their wellbeing, one thing is for sure; it allows for movement and meaningful activity, along with a great distraction. It is something that is fun, requires physical activity, and something that someone can use as a distraction, or something to look forward to.

Suggested Applications

There is minimal research that illustrates the importance of AVGs in mental health. If the Xbox Kinect were to be used in an inpatient setting it would be interesting to examine the responses that patients had to this intervention. If this were to be utilized on an inpatient unit the suggested following model would be used. As part of the normal admission process, the patient would be evaluated by recreational therapy staff. Staff would determine if the patient had any physical or cognitive impairment that might prevent them from participating in an active video game. After evaluating the patient, the staff would examine the symptoms surrounding the patient's diagnosis. If the patient complains of or demonstrates any signs and symptoms of depression, including anxiety,

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

anhedonia, hopelessness, lack of motivation, decreased self-esteem; the staff would qualify these patients to participate in an Xbox Kinect group. As an initial orientation to the group, patients would be introduced to the concept of the Xbox Kinect. Staff would explain the importance of physical activity and leisure and its significance to a person's wellbeing. Staff would survey the patients and inquire about their favorite leisure interests. Prior to attending sessions, the patient would be asked to take a short questionnaire to measure their state of anxiety. The form that would be given is referred to as the State-Trait Anxiety Inventory – Short Form. The STAIAD is a commonly used assessment used in mental health for measuring both state and trait anxiety. The state anxiety section consists of 20 (4-point) Likert scale items and can be typically completed within 5 minutes. Concurrent validity of the STAIAD has been demonstrated through positive correlation scores with The Anxiety Scale Questionnaire (.73), and the Manifest Anxiety Scale (.85). Strong test-retest reliability has also been reported (Tilton, 2008). The short form version of the STAIAD consists of six items and has a reliability coefficient of .95 showing strong correlation to scores of the 20 item full form. Similar mean scores between the short and full version were reported showing strong concurrent validity) (see Appendix B) (Marteau & Bekker, 1992; Spielberger, Gorsuch, & R, 1970).

A typical group session would be as follows: patients would first observe staff playing a game on the Xbox Kinect. Staff will demonstrate required body movements that are necessary to play the selected game and make sure the patients are able to perform these motions appropriately. These motions would include the motions the Xbox Kinect games require the user to perform, such as throwing motions, kicking motions,

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

swinging motions, etc. Then staff will ask the patient to choose from a wide variety of games that have been predetermined based on previous evaluation of a patient's leisure interest. This may have been assessed using a scale such as the Leisure Diagnostic Battery (LDB), which is a "copyrighted collection of instruments designed to enable the assessment of leisure functioning for a wide range of individuals, with or without disability" (Witt & Ellis, 2002). The patients will then play the selected game(s). While playing these games, staff will observe changes in affect, eye contact, verbalized enjoyment, hand-eye coordination, and emotion. After the patients have completed their selected games for the duration of the session, patients will then be asked to rate their anxiety level again on the State-Trait Anxiety Inventory Short Form. Aside from the measurement of anxiety staff will also ask patients to rate their perceived physical exertion using the BORG CR10 scale mentioned before, and patients will also be asked to complete a form about their attitude toward exercise. A scale that might be used to measure this could be the Outcome Expectations for Exercise Scale. The OEE scale consists of a 9 (5-point) Likert scale items. The scale was tested for both reliability and validity using a structural equation modeling approach (Resnick, Zimmerman, Furstenberg, & Magaziner, 2000). All reliability inter-correlations were statistically significant with squared multiple correlations ranging from .42 to .77. Validity was established with path coefficients ranging from .69 to .87 (see Appendix C) (Resnick et al., 2000). Any changes in the above stated criteria would be noted as well as the patient's self report rating about changes in mood.

Conclusion

Depression is unmistakably one of the most significant problems around us, affecting a vast amount of people and impacting their personal wellbeing. The current treatments that are utilized are beneficial in a number of aspects, but saying that, they come with a price. Pharmacotherapy often has non-desirable side effects, as well as not being ideal for some patients. I have suggested the benefits of exercise and leisure on a person's wellbeing. Research has shown that as an alternative to medications and other forms of currently used treatments, exercise and leisure is beneficial to decreasing the symptoms of depression. The use of AVGs makes it possible to utilize both exercise and meaningful leisure in an intervention to promote a patient's wellbeing, while allowing easy access and portability outside the hospital. There is absence of literature that supports AVGs and their effect on a patient's wellbeing in relation to depression. Exploring ways to incorporate these into an institutionalized setting would give great benefits to our mental health community. Recommendations as to potential future applications of AVGs include the suggested applications mentioned and research, which could measure the effect of AVG participation on health outcomes and patient wellbeing from the hospital to the community.

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AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

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AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Appendix A BORG CR10 (Borg, 1985)

0	Nothing at all
1	Very light
2	Light
3	Moderate
4	Somewhat hard
5	Hard
6	
7	Very hard
8	
9	
10	Extremely hard

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Appendix B

State-Trait Anxiety Inventory - Short Form (Speilberger, et, al., 1970)

	Not at All	Somewhat	Moderately	Very Much
1) I feel calm	1	2	3	4
2) I am tense	1	2	3	4
3) I feel upset	1	2	3	4
4) I am relaxed	1	2	3	4
5) I feel content	1	2	3	4
6) I am worried	1	2	3	4

AVGS PROMOTING WELLBEING AS IT RELATES TO DEPRESSION

Appendix C Outcome Expectations for Exercise Scale (Resnick et al., 2000)

Exercise....	SA	A	N	D	SD
1) Makes me feel better physically	1	2	3	4	5
2) Makes my mood better in general	1	2	3	4	5
3) Helps me feel less tired	1	2	3	4	5
4) Makes my muscles stronger	1	2	3	4	5
5) Is an activity I enjoy doing	1	2	3	4	5
6) Gives me a sense of personal accomplishment	1	2	3	4	5
7) Makes me more alert mentally	1	2	3	4	5
8) Improves my endurance in performing daily activities	1	2	3	4	5
9) Helps to strengthen my bones	1	2	3	4	5