

Practice of therapeutic exercise, physical therapy modalities and pet therapy in negotiating with depression in adolescent, adults and elderly population: A narrative review

Aksh Chahal¹, Pooja Chaudhuri², Nitesh Malhotra³, Mohammed Qasheesh⁴ Abu Shaphe^{5*}, Rashid A Beg⁶ and Mudassir N Shah⁷

^{1,4}Assistant Professor, Jazan University, Saudi Arabia

²Associate Professor, USTM Meghalaya, India

³Assistant Professor, Amity Institute of Physiotherapy, Amity University Noida, India

⁵Associate Professor, Jazan University, Saudi Arabia

^{6,7}Lecturer, Jazan University, Saudi Arabia

ABSTRACT

Depression is a mental stage which affects the quality of life in people around the globe. It's a phase in one's life characterized by low mood, reluctance toward performing activities which greatly affect behavior, thought process, short and long term feeling, temporary and permanent well being. A thorough search of the literature was carried out to identify studies investigating therapeutic interventions in treating patients with depression. All the studies were thoroughly searched for the relevant information contained in them. Electronic database, including Embase, Scopus, Pub Med, CINAHL, Web of science were searched for research articles published from the earliest of 2009 to latest of 2016 using keywords of "depression", "Physical therapy", "Therapeutic intervention", "pet therapy". The present study looked into various therapeutic interventions while writing the article. Earlier reported literatures have employed various interventions in treating adolescent, adults and geriatric populations with depression. Limited study have been performed on Pet therapy, the authors are directed to employ more time and efforts in studying new methods to treat depression.

KEY WORDS: DEPRESSION, RELAXATION, AEROBIC, STRENGTHENING, BALANCE, EDUCATION, PET THERAPY

Article Information:*Corresponding Author: mshaphe@jazanu.edu.sa

Received 15/03/2019 Accepted after revision 25/06/2019

Published: 30th June 2019 Pp-251-257

This is an open access article under Creative Commons License,
Published by Society for Science & Nature, Bhopal India.

Available at: <https://bbrc.in/>

Article DOI: <http://dx.doi.org/10.21786/bbrc/12.2/7>

INTRODUCTION

Depression is a mental stage which affects the quality of life in people around the globe¹. It's a phase in one's life characterized by low mood, reluctance toward performing activities which greatly affect behavior, thought process, short and long term feeling, temporary and permanent well-being. It is a syndrome which demonstrates sign and symptoms of darkness in thoughts, feeling of worthlessness, weakness in attitude and slowdown in confidence. Depression is greatly a negative impacting health problem which if ignored in the preliminary stages grows to deeper extent which in return can lead to adverse effects to the community (Cardona-Arias *et al.*, 2015 and Rothon *et al.*, 2010). In other words, it is the widest prevailing psychiatric disorder affecting nearly 121 million adults worldwide which is projected to become the highest epidemiology for a disease by the end of 2020, (Moussavi *et al.*, 2007, (Ozturk *et al.*, 2015, Kujawa *et al.*, 2016 and Tasci *et al.*, 2018).

Over the years, with extensive studies performed on depression by researchers from varied domains around the world, the widely used and favorable therapeutic interventions for depression have been delivered by either using single or combination of interventions (Riemer *et al.* 2012). The choice depends on the current stage of depression which is mild, moderate or severe. If the treatment is started in the early phase, single or two modes of interventions are sufficient and effective, while in moderate and severe depression, a collective therapeutic intervention are used to relieve from agony of depression.

As the authors have mentioned the common and worldwide accepted effective therapeutic interventions towards depression, in the current article the authors would like to concentrate on physical therapy, therapeutic exercises and Pet therapy interventions to treat depression to improve the overall quality of life. The association of exercise with psychological and physical health has been established in healthy along with in

population suffering with long term health conditions like depression.

MATERIAL AND METHODS

A thorough search of the literature was carried out to identify studies investigating therapeutic interventions in treating patients with depression. All the studies were thoroughly searched for the relevant information contained in them. Electronic database, including Embase, Scopus, Pub Med, CINAHL, Web of science were searched for research articles published from the earliest of 2009 to latest of 2019 using keywords of “depression”, “Physical therapy”, “Therapeutic intervention”, “pet therapy”.

General precaution in dealing individuals with depression:

1. The individual's stage and age of depression should be the foremost point of consideration
2. A quiet, single handle environment should be created for inducing techniques of relaxation, breathing exercise.
3. Group classes should be focused for aerobic and strengthening exercises to create interest and develop patient's confidence which they shall gain by seeing other members performing training within the same group.
4. Individuals should be advised not to hold their breath during all interventions and so, inspire from nose and exhale via mouth.

Therapeutic Interventions in treating depression:

1. Relaxation

Instructions:

Foremost, the individual should wear loose and comfortable clothing. He should be put in a quiet space with eyes closed without any interruption and distractions for at least 30 to 45 minutes. The lights should be turned low. Soft background music of natural sounds like rainwater,

Table 1. Represents the widely used different therapeutic interventions

Modes of treatment	Studies performed with therapeutic interventions
Prevention	Gillham Jane <i>et al.</i> , 2000, Boland & Keller, 2002 Buckworth <i>et al.</i> , 2002 and Goodwin <i>et al.</i> , 2003
Antidepressant	Arroll <i>et al.</i> , 2009 and AHRQ 2012
Physical exercise	Trivedi <i>et al.</i> , 2006, Blake <i>et al.</i> , 2009, Rethorst <i>et al.</i> , 2009 and Wideman <i>et al.</i> , 2012, & Rimer <i>et al.</i> , 2012,
Psychological treatment	Cuijpers <i>et al.</i> , 2008, Ambresin <i>et al.</i> , 2012 and Brakemeier <i>et al.</i> , 2012 Klein <i>et al.</i> , 2013 Schaefer <i>et al.</i> , 2013 Emmelkamp <i>et al.</i> , 2014, Trevis <i>et al.</i> , 2016
Tai chi, Qigong and yoga	Saeed <i>et al.</i> , 2010 Jahnke <i>et al.</i> , 2010 Lavretsky <i>et al.</i> , 2011 Li <i>et al.</i> , 2011 Li <i>et al.</i> , 2012 Rimer <i>et al.</i> , 2012 Ryan Abbott, and Helen Lavretsky, 2013 Saeed <i>et al.</i> , 2010
Pet therapy	Brooks <i>et al.</i> , 2016 Abigail <i>et al.</i> , 2017 Germain <i>et al.</i> , 2018 Melanie <i>et al.</i> , 2019

piano and wind can help to relax the person. The phone should be either switched off or put on silent mode. The individual can either select to sit or lie on his back. If sitting on chair, the spine should be straight, with the back and thighs well supported with feet's resting on a support. If lying supine the back should be rested on the mattress while the legs should be kept straight and uncrossed to feel the stream of energy.

Indicators: There are physiological, cognitive, behavioral and emotional responses which occur during relaxation of the body. These are decrease in muscle tension, lowering of heart and respiratory rate, reduction in blood pressure, constriction of pupils, little to no visible movement of the body, followed by closed eyes with flat facial expression and relaxed jaw and hands with the palms opened.

Techniques: a. Contrast Method

The physiology of this method is that a strong contraction of muscle is followed with a phase of equal relaxation for the same muscle. This is an excellent relaxation exercise for individuals with depression. The eyes can be either open or closed, depending on the preference of the individual. This technique consist a sequence of voluntary muscle contractions (induced by one's self) performed from distal to proximal for each limb or pair of limbs which is followed by relaxation. It can be done for upper and lower limbs. The stage of contraction is usually between 6 to 8 seconds followed by relaxation for 25 to 30 seconds. It should be noted that on relaxation the patient should feel warmth in the relaxed muscle.

b. Reciprocal Method: In this technique, the "antagonist muscles" (muscles which work in opposite direction to the actual working muscles) take the patient out from the tensed posture. To induce this mode of relaxation the individual is allowed to remain in the tensed posture either in lying or sitting position. The individual is taught to recognize his tension at any given time and relieve it without unnecessarily changes in his position. The sequence followed is usually proximal to distal, and each part of the body is specified with three instructions which are, move to open the tense position of the body which is followed by no movement and finally, letting the brain to appreciate the new attained posture and making the individual to think about his new posture, (Crone 1993) .The individual should be asked to take time to feel the instinct of relaxation and not be in hurry (Payne 2005)

c. Suggestion Method: This method is used for individuals who may not perform or not willing to perform much of muscle work. In this technique the physical therapist provides a comfortable relaxing environment

with a warm well-ventilated area at ease support, low light and hypnotic tones. The individual is asked to think about each part of his body in turns like to think that his limb is weighty. The suggestions are made several times until the limb furnish the appearance of relaxation, e.g. when the lower limb is rolled out. The individual can be asked to raise his limb and feel as though it is floating. He is then instructed to direct his attention to the other leg following with to each arm in turn and ultimately to the whole body. Deep breathing exercises should be practiced and by the end of the session the individual will be found to have moved in to sleep.

d. Pendulum Swinging: This form of technique is used for relaxation of the shoulder, hip, knee and lumbar spine. Herein, single or both arm and leg are swung back and forth until they feel numb which imply that their sensory receptors have accommodated to the continuous movement. A 1/2 to 1 kg weight as either a dumble or weight cuff can be used in later stages i.e. grasped in the hand or fastened to the ankle.

Breathing techniques: a. Deep breathing exercises

In this technique, the individual is asked to sit with their head and neck on the head rest and back supported on the chair. He is asked to breathe in through nose, such that the belly is filled with air which is confirmed by touching the raised stomach. Simultaneously, he is asked to breathe out through nose following which the belly should be felt lowered. This mode of inspiration and expiration should be continued till the completion of treatment session. Four to five breathe are recommended in one go following which rest is advised for half a minute and same is repeated as per the convenience of the individual, (Valenza *et al.*, 2014).

b. breathing technique : In this technique, the individual is asked to exhale completely through mouth by making use of tongue to produce a whooshing sound. Following which the individual is asked to close the mouth slowly and inhale silently via nose with count of four. He is taught to count mentally till 7 while holding breathe and subsequently exhale from count of 8 along while producing a audible whooshing sound.

3. **Aerobic techniques:** Activities like cycling, skipping, slow/medium/high speed walking, jogging, spot jogging, running, swimming, stair climbing, hiking, dance and aquarobics etc. are performed as aerobic exercise in individuals with depression. The activity is selected depending on individual's age, severity and level of fitness. These exercises benefit the body by improving cardiovascular fitness, maintenance of blood pressure which decreases risk for heart disease, diabetics, bowel cancer and osteoporosis, increase level of cognition and physical fitness, (Conn *et al.*, 2010). In return these effects help the individual to elevate his mood which

plays a vital role in increasing social integration within the society, (Wegner *et al.*, 2014).

4. Strengthening techniques: While devising a strengthening protocol for patient with depression, the Frequency Intensity Time and Type (FITT) principle issued by American college of sports medicine and centre for disease control and prevention should be used to design and implement a safe, efficient and enjoyable session (Chen *et al.*, 2009). Frequency=Minimum of 2-3 days per week, Intensity = Mild depression (12-15 repetitions per body part), Moderate depression (5-10 repetitions per body part), Severe depression (2-5 repetitions per body part), Time = 45 minutes to 1 hour for mild to moderate depression, 2-3 sets per muscle group in each session.

Type = Individuals unfamiliar to any type of strength training in their past should be encouraged to exercise using mechanical machines as they reduces the risk of injury. Whereas, individual familiar to any kind of strength training, should be trained in present by making use of machines or free weights. Free weights offer strength training in conjugation with balance training as free weights require and exert higher level of balance. While performing these exercises the individual should be asked not to hold their breath while lifting weights, as holding breath may lead to increase in blood pressure leading to abnormal heart rhythms. In addition, individuals suffering from any cardiac diseases should perform one to two set of exercise per session.

5. Postural awareness: In standing: Individuals should be trained towards development and maintenance of an erect posture. A chin tuck, retracted shoulder, erect trunk, buttocks protruded, hip and knee joint aligned in straight line with ankle neutral, foot and toes slightly outwards should be practiced at regular intervals during the day.

In sitting: Individuals should be trained to sit in a relaxed posture by resting the head on headrest, shoulder resting on the upper back of the chair with the buttocks and thigh completely supported on the cushioned seat and the ankle falling directly under the knee with the foot and toes placed on the floor. Postural awareness helps to improve chest expansion, reduce chances of kyphosis, scoliosis, forward head posture, flat back and postural back pain (Fujino H 2012).

6. Balance training

Individuals with depression should be trained for balance by performing activities like standing on both feet, standing on one foot, standing on balance board with both foot (Li *et al.*, 2015), standing on balance board with one foot and backward walking etc. Any kind of unstable, rubble surface should be avoided. The training area should be with ample of free space to prevent

any physical injuries. A chair, wall or railing should be placed around the individual to be used in an emergency occurring due to lack of balance.

7. Educational interventions

All educational establishments (school, college and universities) should appoint professional counsellors and physical therapist on regular basis. Students studying in higher secondary, college or university level should be evaluated for depression at regular intervals using universally accepted depression questionnaires and scales. Early detection of depression will prevent future devastating effects on the individual's psychology (Hassett, *et al.*, 2009). In addition, students detected with depression should be evaluated for their physical fitness by physical therapist. Students desiring to be voluntaries can be trained to detect depression among their peer group and family members, thus, lend a helping by spreading awareness of implications, methods and prevention of depression by organizing camps at supermarkets, malls and social clubs etc as a step towards serving the society. Students should be perfected for preparing handouts in creative ways by using local language (Butler, *et al.*, 2006).

8. Physical therapy modalities

Transcutaneous Electrical Nerve Stimulation (TENS), Microcurrent Electrical Nerve Stimulation (MENS), Shortwave Diathermy (SWD), Microwave Diathermy (MWD), LASER, Ultrasound, Infra Red Lamp, Interferential Therapy, Vacuum therapy biofeedback and hot packs are physical therapy modalities used to reduced pain, improve circulation which enhances healing of soft tissues to increase perception of relaxation, whereas Faradic, Di dynamic, High voltage and Russian currents can be used to improve the muscle strength the body during mild, moderate or severe phase of depression (Giggins *et al.*, 2013).

9. Pet therapy

Along with the above therapeutic interventions, the authors would like to encourage a recent, slowly getting popular mode of treatment for cases of mild, moderate to severe depression which is referred as 'Pet therapy'. "You just need a pet" may be a dog, cat, squirrel etc. Pets help humans in many ways (Beetz *et al.*, 2012). They help to maintain a regular schedule of individual's getting up from bed, leaving home early morning and returning back by early evening and preparing food for their pet. These acts with time help to improve and gradually increase level of physical activity (Gee 2009), fitness and mental alertness. Pet therapy also has a equal and positive effect on an individual's psychology i.e. patting or stroking the animals promotes sense of calmness which

improves psychological mindset of the individual, going for slow or brisk walk with the pet helps in developing confidence and increase social encountering, (Cardoso et al., 2011). People, who have felt positiveness with pets while suffering with depression, can solely explain the positive feeling which evolves when you have someone to love and be loved all the time around you (Brooks et al. 2016). Hence, the authors encourage researchers from all over to perform research on short and long term benefits of pet therapy in curing mild, moderate and severe depression.

CONCLUSION

The present study looked into various therapeutic interventions while writing the article. Earlier reported literatures have employed various interventions in treating adolescent, adults and geriatric populations with depression. Limited study have been performed on Pet therapy, Therefore the authors are directed to employ more time and efforts in studying new methods to treat depression.

Conflict of Interest: NIL, **Source of funding:** NIL, **Ethical clearance:** N/A

REFERENCES

- Abbott R, Lavretsky H. (2013) Tai Chi and Qigong for the Treatment and Prevention of Mental Disorders. *Psychiatric Clinics of North America*; Vol 36 No. 1: Pages 109 -119. <https://doi.org/10.1016/j.psc.2013.01.011>
- Agency for Health Research and Quality (AHRQ). (2012) Medicine for treating depression; A review of the research for adults. Department of Health and Human Services, USA Pub.no.12-EHC012-A.
- Ambresin G, Despland J.N, Preisig N, De Roten Y. (2012) Efficacy of an adjunctive brief psychodynamic psychotherapy to usual impatient treatment of depression: rationale and design of a randomized controlled trial. *BioMed Central Psychiatry*; Vol. 12 No.1: 182. <https://doi.org/10.1186/1471-244X-12-182>
- Arroll B, Elley C.R, Fishman T, Goodyear-Smith F.A, Kenealy T, Blashki G. (2009) Anti-depressants versus placebo for depression in primary care . *Cochrane Database Systemic reviews*; Vol. 8 No.3: CD007954 <https://doi.org/10.1002/14651858.CD007954>
- Beetz A, Uvnäs-Moberg K , Julius H, Kotrschal K. (2012) Psychosocial and Psychophysiological Effects of Human-Animal Interactions: The Possible Role of Oxytocin. *Frontiers in Psychology*; Vol. 3. Art. 234: Pages 1-15. <https://doi.org/10.3389/fpsyg.2012.00234>
- Blake H, Malik S, Thomas S. (2009) How effective are physical activity interventions for alleviating depressive symptoms in older people? A systematic review. *Clinical Rehabilitation*; Vol.23 No.10: Pages 873-887. <https://doi.org/10.1177/026921550337449>
- Brakemeier E.L, Frase L. (2012) Interpersonal psychotherapy (IPT) in major depressive disorder. *European Archives of Psychiatry and Clinical Neuroscience*; 262 suppl. 2: Pages 117-121. <https://doi.org/10.1007/s00406-012-0357-0>
- Brooks H, Rushton K, Walker S, Lovell K, Rogers A. (2016) Ontological security and connectivity provided by pets: a study in the self-management of the everyday lives of people diagnosed with a long term mental health condition. *BioMed Central Psychology*; Vol. 16 No. 1:409. <https://doi.org/10.1186/s12888-016-1111-3>
- Buckworth J, Dishman R.K. (2002) 2nd Ed Exercises psychology. Human kinetics.
- Butler A.C, Chapman, J.E, Forman, E.M, et al. (2006) The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clinical Psychology Review*; Vol. 26: Pages 17-31 <https://doi.org/10.1016/j.cpr.2005.07.003>
- Cardona-Arias J.A, Pérez-Restrepo D, Rivera-Ocampo S, Gómez Martínez J, Reyes A. (2015) Prevalence of anxiety in students of a university. *Diversitas: Perspectivas en Psicología*; Vol. 11 No. 1: Pages 79-89 <https://doi.org/10.15332/s1794-9998.2015.0001.05>
- Cardoso C, Ellenbogen, M.A, Linnen A-M. (2011). Acute intranasal oxytocin improves positive self-perceptions of personality. *Psychopharmacology*; Vol. 220 No.4: Pages 741-749 <https://doi.org/10.1007/s00213-011-2527-6>
- Chen W.C, Chu H, Lu R.B, et al. (2009) Efficacy of progressive muscle relaxation training in reducing anxiety in patients with acute schizophrenia. *Journal of Clinical Nursing*; Vol. 18, No. 15: Pages. 2187-2196. <https://doi.org/10.1111/j.1365-2702.2008.02773.x>
- Conn V.S. (2010) Anxiety outcomes after physical activity interventions: Meta-analysis findings. *Nursing Research*; Vol 59 No. 3: Pages 224-31. <https://doi.org/10.1097/NNR.0b013e3181dbb2f8>
- Cuijpers P, Van Straten A, Warmerdam L, Smits N. (2008) Characteristics of effective psychological treatments of depression; a meta-regression analysis. *Psychotherapy Research*; Vol. 18 No. 2 :Pages 225-36 <https://doi.org/10.1080/10503300701442027>
- Dunford E, Thompson M. (2010) Relaxation and Mindfulness in Pain: A Review. *British Journal of Pain*; Vol. 4 No.1: Pages 18-22. <https://doi.org/10.1177/204946371000400105>
- Emmel Kamp P.M, David D, Beckers T, et al. (2014) Advancing psychotherapy and evidence-based psychological interventions. *International Journal of Methods in Psychiatric Research*; Vol.23 No 1: Pages 58-91. <https://doi.org/10.1002/mpr.1411>
- Fujino H. (2012) Effects of Dohsa-hou relaxation on body awareness and psychological distress japanese Psychological Research; Vol.54, No. 4: Pages 388-399. <https://doi.org/10.1111/j.1468-5884.2012.00517.x>
- Gee, N. R, Sherlock, T.R, Bennett E.A, Harris, S. L. (2009) Preschooler's adherence to instruction as a function of presence of a dog and motor skill task. *Anthrozoos*; Vol 22: Pages 267-276. <https://doi.org/10.2752/175303709X457603>

- Gelenberg A.J. (2017) The prevalence and impact of depression. *The Journal of Clinical Psychiatry*; Vol. 71 No.3:e06. <https://doi.org/10.4088/JCP.8001tx17c>
- Germain S.M, Wilkie K.D, Milbourne V.M.K, Theule J. (2018) Animal-assisted Psychotherapy and Trauma: A Meta-analysis. *Anthropos*; Vol. 31 No. 2: Pages 141-64. <https://doi.org/10.1080/08927936.2018.1434044>
- Giggins O.M, McCarthy P.U, Caulfield B. (2013) *Journal of NeuroEngineering and Rehabilitation*; Vol.10 No. 60: Pages 1-11. <https://doi.org/10.1186/1743-0003-10-60>
- Gillham, J.E, Reivich, K.J, Freres, D.R., Lascher M, Litzinger, S, Shatté A, & Seligman M.E.P. (2006). School-based prevention of depression and anxiety symptoms in early adolescence: A pilot of a parent intervention component. *School Psychology Quarterly* ; Vol.21 No.3 :Pages 323-348.<https://doi.org/10.1521/scpq.2006.21.3.323>
- Goodwin R.D. (2003) Association between physical activity and mental disorders among adults in the United States. *Preventive Medicine*; Vol.36 No.6 :Pages 698-703. [https://doi.org/10.1016/S0091-7435\(03\)00042-2](https://doi.org/10.1016/S0091-7435(03)00042-2)
- Hassett A.L, Richard N, Gevirtz. (2009) Nonpharmacologic Treatment for Fibromyalgia: Patient Education, Cognitive-Behavioral Therapy, relaxation Techniques, and Complementary and Alternative Medicine. *Rheumatic diseases clinics of North America*; Vol. 35 No. 2: Pages 393-407. <https://doi.org/10.1016/j.rdc.2009.05.003>
- Jahnke R, Larkey L, Rogers C, et al. (2010) A comprehensive review of health benefits of qigong and tai chi. *American Journal of Health Promotion*; Vol.24 No.6: Pages e1-e25. <https://doi.org/10.4278/ajhp.081013-LIT-248>
- Jones M, Rice S, Cotton S. (2018) Who let the dogs out? Therapy dogs in clinical practice. *Australasian Psychiatry*; Vol 26 No.2: Pages 196-9. <https://doi.org/10.1177/1039856217749056>
- Klein J.P, Berger T, Schröder J, et al. (2013) The EVIDENT-trial: Protocol and rationale of a multicenter randomized controlled trial testing the effectiveness of an online-based psychological intervention. *BMC Psychiatry*; Vol. 13:Pages 239 <https://doi.org/10.1186/1471-244X-13-239>
- Kujawa A, Burkhouse K. (2016) Vulnerability to depression in youth: Advances from affective Neuroscience. *Biological psychiatry: cognitive neuroscience and neuroimaging*; Vol 2 No 1 :Pages 28-37. <https://doi.org/10.1016/j.bpsc.2016.09.006>
- Lavretsky H, Alstein L.L, Olmstead R.E, et al. (2011) Complementary use of tai chi chih augments escitalopram treatment of geriatric depression: a randomized controlled trial. *The American Journal of Geriatric Psychiatry*; Vol.19 No. 10: Pages 839-50. <https://doi.org/10.1097/JGP.0b013e31820ee9ef>
- Li F, Harmer P, Fitzgerald K, et al. (2012) Tai chi and postural stability in patients with Parkinson's disease. *The New England Journal of Medicine*; Vol. 366 No. 6: Pages 511-519. <https://doi.org/10.1056/NEJMoa1107911>
- Li J.Y, Zhang Y.F, Smith G.S, et al. (2011) Quality of reporting of randomized clinical trials in tai chi interventions—a systematic review. *Evidence-Based Complementary and Alternative Medicine*; 2011:383-245.<https://doi.org/10.1093/ecam/nep022>
- Li Y , Wang R, Tang J, Chen C, Tan L, Wu Z, et al. (2015) Progressive Muscle Relaxation Improves Anxiety and Depression of Pulmonary Arterial Hypertension Patient Evidence-Based Complementary and Alternative Medicine; Vol. 2015 Art. 792895: Pages 1-8. <https://doi.org/10.1155/2015/792895>
- Melanie G, Jones Simon M, Rice Susan M.C. (2019) Incorporating animal-assisted therapy in mental health treatments for adolescents: A systematic review of canine assisted psychotherapy. *Public Library of Science One*; Vol.14 No.1: e0210761. <https://doi.org/10.1371/journal.pone.0210761>
- Mohr D.C, Ho J, Duffecy J, et al. (2010) Perceived barriers to psychological treatments and their relationship to depression. *Journal of Clinical Psychology*; Vol 66 No. 4: Pages 394-409. <https://doi.org/10.1002/jclp.20659>
- Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B. (2007) Depression, chronic diseases and decrements in health: results from the World Health Surveys. *Lancet*. Vol.370 Pages 851-859. [https://doi.org/10.1016/S0140-6736\(07\)61415-9](https://doi.org/10.1016/S0140-6736(07)61415-9)
- Muldoon A.L, Kuhns L.M, Supple J, Jacobson K.C, Garofalo R. (2017) A Web-Based Study of Dog Ownership and Depression Among People Living With HIV. *Journal of Medical Internet Research Mental Health*; Vol 4 No.4: Pages e53. <https://doi.org/10.2196/mental.8180>
- Ozturk O, Ulusahin A. (2015) *Mental health and disorders*. 13th ed. Ankara: Nobel Medical Books.
- Payne R.A. (2005) *Relaxation Techniques: A Practical Handbook for the Health Care Professional*. 3rd Ed.
- Rethorst C.D, Wipfli B.M, Landers D.M. (2009) The antidepressive effects of exercise: A meta analysis of randomized trials. *Sports Medicine*; Vol.39 No.6: Pages 491-511. <https://doi.org/10.2165/00007256-200939060-00004>
- Rimer J, Dwan K, Lawlor D.A, Greig C.A, McMurdo M, Morley W. (2012) Exercise for depression. *Cochrane Database Systemic reviews*; Vol.11 No. 7: CD004366.<https://doi.org/10.1002/14651858.CD004366.pub5>
- Rothon C, Edwards P, Bhui K. (2010) Physical activity and depressive symptoms in adolescent: a perspective study. *BioMed Central Medicine*; Vol. 8 No.32: Pages 1-9. <https://doi.org/10.1186/1741-7015-8-32>
- Saeed S.Y, Antonacci D.J, Bloch R.M. (2010) Exercise, yoga and meditation for depressive and anxiety disorders. *American Family Physician*; Vol. 81 No. 8: Pages 981-986. <https://www.ncbi.nlm.nih.gov/pubmed/20387774>
- Schaefer R, Höner C, Salm F, et al. (2013) Psychological and behavioral variables associated with the somatic symptom severity of general hospital outpatients in China. *General Hospital Psychiatry*; Vol. 35: Pages 297-303 <https://doi.org/10.1016/j.genhosppsy.2012.11.001>
- Shadbad, Nasrin Rahimi. (2017) The Effectiveness of Mindfulness-Based Group Therapy on Reducing Internet Addiction and Increasing the General Health of Adolescent Girls. *Indian Journal of Public Health Research & Development*;

Vol. 8 No. 4: Pages 44-48. 5p. <https://doi.org/10.5958/0976-5506.2017.00311.4>

Tasci G, Baykara S, Gurok M.G, Atmaca M. (2018) Effects of exercise on therapeutic response in depression treatment. *Psychiatry and clinical psychopharmacology*; Vol.29 No.2:Pages137-143.<https://doi.org/10.1080/24750573.2018.1426159>

Trevis K.J, Mc Lachlan N.M, Wilson S.J. (2016) Psychological mediators of chronic tinnitus: the critical role of depression. *Journal of Affective Disorders*; Vol. 204: Pages 234-40 <https://doi.org/10.1016/j.jad.2016.06.055>

Trivedi M.H, Greer T.L, Grannemann B.D, Chambliss H.O, Jordan A.N. (2006) Exercise as an augmentation strategy for treatment of major depression. *Journal of Psychiatric Practice*; Vol. 12 No. 4: Pages 205-213. <https://doi.org/10.1097/00131746-200607000-00002>

Valenza M.C, Geraldine V.P, Torres-Sánchez I, González-Jiménez E, et al. (2014) Effectiveness of Controlled Breathing Techniques on Anxiety and Depression in Hospitalized Patients with COPD: A Randomized Clinical Trial *Respiratory Care*; Vol. 59 No.2: Pages 209-215. <https://doi.org/10.4187/respcare.02565>

Wegner M, Helmich I, Machado S, Nardi A.E, Arias-Carrion O, Budde H. (2014) Effects of Exercise on Anxiety and Depression Disorders. Review of Meta- Analyses and Neurobiological Mechanisms. *CNS & Neurological Disorders - Drug Targets*; Vol. 13 No. 6: Pages 1002-1014. <https://doi.org/10.2174/1871527313666140612102841>

Wideman T.H, Scott W, Martel M.O, Sullivan M.J.L. (2012) Recovery from Depressive symptoms over the course of physical therapy: A perspective cohort study of individuals with work related orthopedic injuries and symptoms of depression. *The Journal of orthopedics and sports physical therapy*; Vol.42 No.11: Pages 957-967. <https://doi.org/10.2519/jospt.2012.4182>