Journal of Community Guidance & Research
2021 Vol. 38 No. 1 PP. 1-13
ISSN-0970-1346

YOGA FOR BETTER DIABETES MANAGEMENT (REVIEW OF LITERATURE)

Sofiya Thomas

Abstract

Diabetes is one of the chronic illnesses which cannot be completely cured. It can be managed through various management strategies. These strategies have to consider both mind and body of the individual for better management of their diabetic condition. Because the individual's various physical, psychological and social factors directly influence their diabetes condition. Since Yoga involves mind-body interactions, it utilizes the mind's capacity to have an influence on body and its physiological activities. Yoga is now regarded as a complementary for self-management of many stress related disorders like Diabetes, Coronary Artery Disease (CAD) etc. This review is aimed to bring-out the effects of Yoga including Asanas, Pranayama and Dhyana on better Diabetes management.

Keywords: Diabetes, Diabetes management, Yoga, Asana, Pranayama, Dhyana

Introduction

Diabetes/Diabetes Mellitus (DM) is one of the chronic illnesses and more prevalent all over the world. It is a prolonged metabolic condition causing high level of glucose content in blood due to impaired insulin production and function. Since it is one of the chronic conditions, it cannot be cured but can be controlled or managed. For the better management of Diabetes, both the mind and body of the individual with diabetes have to be considered. Because the

❑ ***Sofiya Thomas*** *is a IMSc., Health Psychology, UoH, Assistant Professor, Don Bosco Arts and Science College, Angadikkadav, Kerala.*

The Author is particularly grateful for the assistance given by Ms. Niveditha Akula throughout this review paper.

individual's physical, emotional, mental, social, spiritual and behavioral factors can directly affect their health. Diabetic Management includes maintaining blood glucose level by medication, food intake and other physical activities, maintaining blood cholesterol and lipid level as normal, regulating blood pressure and preventing possibilities of developing diabetes related health issues. The management strategies include basic educations regarding the diabetic condition, Dietary treatment, Meal planning, exercise, Drug treatment. Along with all these management strategies various psychological interventions are used for enhancing psychological wellbeing of the diabetic individual. Psychological wellbeing has an important role in the better prognosis of diabetes condition (Sofiya, 2020). Such psychological interventions are psycho-education considering the health beliefs of the patient, cognitive behavioral therapy includes cognitive restructuring, behavioral therapy includes lifestyle management, motivational interviewing, family therapy and Mind body interventions can be used in Diabetes condition.

Yoga as an Intervention for better Diabetes Management

Yoga is considered as one of the Mind-body interventions, it utilizes the mind's capacity to have an influence on body and its physiological activities. Yoga is a traditional mind-body system originating in India over 4000 years ago (Fishman & Saltonstall, 2008), focuses on bringing harmony between mind and body. It is one of the best and popular interventions for life style management. The word yoga is originated from a Sanskrit word; '*Yuj'* means to unite or to join. So the practice of Yoga emphasis on union of one's body and mind to the universal power. It leads to balance of an individual's various aspects such as physical, mental, emotional and spiritual. One who practices yoga and experiences the harmony is termed as Yogi, having attained to a state of freedom (*Kaivalya*). This freedom is referred to as *Mukti*, *nirvana* or *Moksha*. It says that the ultimate goal of Yoga is self actualization. Shiva is considered as the first yogi (*adi yogi*) and the first guru (*adi guru*). It is believed that thousands years ago, adi yogi shared his knowledge about Yoga to the *Saptarishis* or seven sages on the banks of the lake

Kantisarovar (Himalaya). Then the sages spread this valuable knowledge to different parts of the world. It was in India that the yoga found its fullest expression. The presence of Yoga in ancient India was evident by the seals and fossils remain of Indus Valley civilization with yogic motives and movements. Folk traditions, Indus Valley Civilization, *Vedic* and *Upanishadic* heritage, Budhist and Jain traditions, *Darshanas*, epics of *Mahabharat* and *Ramayana*, theistic traditions of *Shaivas*, *Vaishanavas* and *Tantric* traditions are showing the presence of Yoga. The existence of Yoga was seen in the pre-Vedic period (2700 B.C) and the period between 500 B.C and 800A.D (tentatively) is considered as the classical period of development of Yoga. Yoga is considered as the method for maintaining and promoting both physical and mental health in this contemporary period. It is also understood as an intervention for health and fitness. An important fact is that Yoga is not a part of any particular religion, belief, ethnicity and culture. They widely practiced Yoga practices (*Sadhanas*/ meditation) are *Yama*/right living, *Niyama*/positive duties, *Asana*/ body posture, *Pranayama*/ breathing technique, *Pratyahara*/ weaning away from food, *Dharana*/concentration of the mind, *Dhyana*/meditation, *Samadhi*/enlightenment, *Bandhas*/ body lock & *Mudras*/hand gestures, *Shat-Karmas*/six purification technique, *Yukta-ahara*/regulating eating, *Yukta karma*/unselfish action, *Mantra japa*/meditative repetition of mantra or word or phrase, etc. Here, we mainly focus on *Asana, Pranayama and Dhyana* (Meditation).

Yoga and Various Diseases

Yoga is considered as the complimentary intervention alone and also in combination with other treatments for various physical diseases and also regarded as a complementary for self-management of many stress related disorders like Diabetes, Coronary Artery Disease (CAD) etc.

- **Diabetes Mellitus:** It is a medical condition of imbalance of blood glucose level in the body. It can be due to insufficient insulin production or due to inadequate response of body to insulin. Individual with Diabetes may face symptoms like blurred vision, hunger, peeing more often and thirsty, dry mouth and fatigue. Yoga

postures as treatment suggested for Diabetes are *Ardha Matsyendrasana* (half spinal twist), it controls blood sugar level and *Chakrasana* (Wheel pose) for managing diabetes.

- **Digestive problems:** digestive issues and other stomach problems result in various health issues. The symptoms of digestive issues are many; few of them are pain in abdominal area, nausea, vomiting, diarrhea and constipation. These issues can be treated with *Apanasana* (Knees to chest pose), it relieves acidity, symptoms of indigestion and the entire body is benefited by the removal of toxic substances. Another yoga posture called *Paschimottanasana* (Seated Forward Bend Pose), this stretch can address digestive problems.
- **Thyroid:** It is a medical condition caused by dysfunction of thyroid gland in releasing hormones which help in body metabolism. It may cause neck swelling, joint or muscle pain, constipation, muscle weakness, weight gain/ loss, tiredness, depression and anxiety. This dysfunction can be treated by practicing *Halasana*/Plough pose (stimulates thyroid glands by compressing neck portion) and *Matsyasana*/ Fish pose (stretching neck and triggers the thyroid glands).
- **Polycystic Ovarian Syndrome:** It is a hormonal syndrome of small cysts in ovaries, affecting menstrual cycle and reproductive functions. It can results in obesity, facial hair, hair loss and emotional instabilities. Yoga postures such as *Dhanurasana*/ Bow pose, helps in galvanizing reproductive organs and *Bhujangasana*/ cobra pose, helps in regulating ovarian functions.
- **Arthritis:** It is a rheumatic condition causing stiffness, swelling and pain in joints. It results in decreased body movement. There are few Yoga poses used for Arthritis, *Shishuasana*/ Child pose (helps in straightening vertibra) and *Adho Mukha Svanasana*/ downward facing dog pose.
- **Migraine:** It is a chronic neurological condition. It

causes multiple symptoms such as severe pain either on one side or two sides of the head, sensitivity to light, sound and smells, nousea, vomiting, blurred vision, hyperactivity and irritability. Yoga postures suggested for treating migraine are *Padmasana* (Lotus pose), it reduces headache and *Sirsasana* (Head stand or *Salamba Sirsasana* or Supported headstand). It increases the flow of blood in brain and alleviate headache.

- **Liver problems:** Liver is one of the most important organs in the body, it regulates because it influences and regulates protein production, blood clotting and metabolic functions. Symptoms can be weight loss, fatigue, nausea, vomiting, pain in abdomen, yellow skin and eyes and itching or swelling. There are various Yoga postures supporting the treatments of Liver diseases such as *Ardha Bhekasana* (Half Frog Pose) and *Parighasana* (Gate Pose).
- **Kidney disorders:** Kidney plays a vital role in the body; it removes waste and excess fluid and keeps electrolyte balance. Dysfunctions of kidney shows symptoms like Changes in urination, swelling of the feet, ankles, hands, or face, fatigue or weakness, metal taste in the mouth and Back pain. *Salamba Bhujangasana* (Sphinx pose) yoga posture can increase the immunity level and the *Naukasana* (Boat pose) improves digestion and alleviate stress.

Some of the psychological benefits of regular yoga practice are stress reduction, increased self-awareness, less anxiety and depression, improved concentration, inner peace and calm, more positive view of self/ others, increased body awareness and acceptance, increased energy and vitality, heightened sense of control of one's body and mind, decline in self-destructive patterns, improved self-confidence, increased mental clarity, improved reaction time, improved learning ability and memory, increased ability to be present in the moment, greater creativity, improved sleep and increased emotional stability.

Yoga exercises for better Diabetes Management

Yoga incorporates physical activity, stretching, meditation, and

breathes control, as well as the adoption of a general healthy life style and diet (De Michaelis, 2005; Feuerstein, 1998). Yoga is most often associated with physical postures (*asanas*), breathing techniques (*pranayama*), and meditation (*dhyana*) (De Michaelis, 2005; Feuerstein, 1998). Many studies found Yoga based life style intervention as helpful in improved wellbeing (Sharma et al., 2008; Kosuri et al., 2009; McDermott et al., 2014; Keerthi et al., 2017), reduction of Body Mass Index (Kosuri et al., 2009; McDermott et al., 2014) decreased anxiety (Kosuri et al., 2009), reduced stress (Kumar et al., 2012; Alexander et al., 2013), personality (Kumar et al., 2012), improved overall physical functioning, quality of life (Alexander et al., 2013; Keerthi et al., 2017) and efforts towards diet and enhanced calmness (Alexander et al., 2013). Cokolic et al., (2013) found intense laughter yoga workout significantly reduced the level of blood glucose in people with type 2 diabetes immediately after exercise, irrespective of whether or not using drugs to treat type 2 diabetes and also had a favorable impact on the well-being of the individuals as it improved enthusiasm, positive attitude, breathing, energy level, mood, optimism, stress level, and physical and mental relaxation. A pilot study conducted by Vizcaino, (2013) on *Hatha yoga* practice for Type 2 Diabetes patients. Results revealed that there were no significant changes in glucose control or physiological stress but there was a significant change in perceived stress, state anxiety and self-care behaviors.

Asanas (physical postures)

Singh et al., (2001) conducted a study to understand the effects of Yoga *Asanas* on diabetic patients. The results showed that practicing various *Asanas* helped them to reduce stress and to improve day to day performance. *Asana* is a state of being in which one can remain physically and mentally steady, calm, quiet and comfortable and it contributes to wellbeing of the individual. *Asanas* have variety of impacts on the body include complete relaxation to body parts through body awareness, strengthening and balancing of body muscles through holding them in gently stretched manner, improved mobilization of joints, improvement of body posture, improvement of breathing, relaxation of nervous system, promotion of homoeostasis in cardiovascular, digestive, endocrine and other systems.

Asanas also help in rejuvenating the pancreatic cells, thereby assisting insulin secretion. The muscular movements also help in bringing down the blood sugar levels by increasing the glucose utilization.

There are number of *Asanas*. Few of them are *Bandha Sarvangasana* (bridge), *Adho Mukha Svanasana* (downward dog), *Balasana* (child pose), *Sukhasana* (easy pose), *Vikrabhadrasana* (warrior), *Trikonasana* (triangle), *Chaturanga* (four limbed staff), *Utkatasana* (chair), *Vrksasana* (tree), *Navasana* (boat), *Bakasana* (crow), *Pincha Mayurasana* (arm balance), *Natarajasana* (king dancer) and *Savasana* (corpose).

Other studies also found that Yoga *Asanas* have great role in decreased Glycosylated Hemoglobin, reduced weight, improved physical and mental alertness (Malhotra et al., 2004; Dash & Thakur, 2014; Srivastava & Tiwari, 2015), reduction of drug doses (Dash & Thakur, 2014; Srivastava & Tiwari, 2015), improved sense of wellbeing (Malhotra et al., 2004; Kumar et al., 2012; Dash & Thakur, 2014; Srivastava & Tiwari, 2015; Keerthi et al., 2017), improved Quality of life (Keerthi et al., 2017), self motivated to continue yoga practice (Dash & Thakur, 2014; Srivastava & Tiwari, 2015), adherence to diet and medication (Dasappa et al., 2016), reduced anxiety, stress (Kumar et al., 2012; Dash & Thakur, 2014; Chimkode et al., 2015), improved personality (Kumar et al., 2012), healing co morbid diseases (Ahilan, 2015).

Pranayama (breathing technique)

Pranayama (*Prana* means breath and *ayana* means control) are art of breathing techniques which harmonize the body and mind. According to Yogendra (1965), *Pranayama* is the control of life force through the art of breathing. These breathing techniques are controlled by both conscious and unconscious neural pathways.

There are various types of Pranayama. Few of them are Natural Breathing, Basic Abdominal Breathing, Thoracic Breathing, Clavicular Breathing, Yogic Breathing, Deep Breathing with ratios, Fast Breathing, *Viloma* (interrupted breathing), *Anulom Vilom* (Alternate Nostril Breathing), Cooling Breath, *Ujjayi* Breath (Victorious breathing), *Bharamari* (humming bee breath), *Bhastrika*

(bellow's breath) and *Surya Bhedan* (right nostril breathing).

Improving the breathing pattern promotes health through increasing the lung capacity (Yadav & Das, 2001; Frostell, 1983) and improving your ability to relax body and mind (Granath, 2006). A study conducted by Balaji, Varne and Ali (2011) to see the effect of Pranayama on type 2 diabetes patients, revealed that there was a significant reduction in stress, improvement in mood, self-efficacy and quality of life along with other physiological changes. There are the studies conducted to find out the role of *Pranayama* on better diabetes management. They also found Pranayama as helpful in decreased in Glycosylated Hemoglobin, reducing obesity, improved physical and mental alertness, reduction of drug doses, improved sense of wellbeing and self motivated to continue yoga practice (Srivastava & Tiwari, 2015), improved adherence to diet and medication (Dasappa et al., 2016), developing a sense of wellbeing (Malhotra et al., 2004; Dash & Thakur, 2014; Ahilan, 2015; Keerthi et al., 2017), alertness and attentiveness along with reduction in glucose level in blood (Malhotra et al., 2004; Kumar et al., 2012), reduced anxiety and improved personality in patients with chronic diseases (Kumar et al., 2012), reduced stress (Dash & Thakur, 2014; Chimkode et al., 2015), and drug intake (Dash & Thakur, 2014), healing co morbid diseases and optimum healthy life along with regulating body physiology (Ahilan, 2015).

Dhyana (meditation)

Dhyana/Meditation helps in maintaining hormonal balance, stimulating the communication between the brain hemispheres (Khalsa, 2004) and allowing the mind to be in a state of calm. *Dhyana* is also useful in the management of stress by balancing between Sympathetic and Parasympathetic nervous system and dealing with anxiety. It has positive impacts on blood glucose levels, thereby helps in the treatment of diabetes.

There are different types of Meditation; Mindfulness Meditation (bring one's attention to a present point non judgmentally), Transcendental Meditation (chanting a word or '*om'* and breathing), Moving Meditation (integrates mind and body through movements and breathing) and Concentration Meditation (focus on

a single point, it can be a flame of a candle, word or mantra and listening to a particular song).

A quasi-experimental study was conducted by Rungreangkulkij et al., (2011) among sixty two patients with Type 2 Diabetes and with depressive symptoms. They practiced Meditation for 6 months and they found that there was a significant improvement on depression score and greater acceptance of current living condition. Practicing meditation is also helpful in significant improvement in diabetes control, relaxation (Keyworth et al., 2014; Maras et al., 2015), sense of psychological wellbeing (Ahilan, 2015; Maras et al., 2015; Keerthi et al., 2017), reduction in stress (Maras et al., 2015; Chimkode et al., 2015), improved sleep and better acceptance of illness and illness experience (Keyworth et al., 2014), healing co morbid diseases and optimum healthy life along with regulating body physiology (Ahilan, 2015) and improved quality of life (Keerthi et al., 2017).

Conclusion

These findings clearly emphasized that the Yoga intervention has positive impacts on better management of Diabetes condition. Practicing various Yoga techniques is positively linked to reduction in stress, anxiety and depression, improvement in day to day performance, mood, enthusiasm, positive attitude and affect, energy level, sense of happiness, optimism, self efficacy, quality of life, self care behavior, experience of sleep and adherence to medication and diet. Benefits of Yoga also results in enhanced calmness, better acceptance of illness and illness experience, increased attentiveness, mental alertness and relaxation. Type 2 Diabetes patients suffering from complications like diabetic foot, diabetic neuropathy, enervation, loss of proprioception, all can lead to injuries in a patient while performing heavy physical exercise or walking. So that, practicing *Asanas*, *Pranayama* and *Dhyana* can be beneficial for them. In addition to that, Yoga requires only a little space and no equipments. It makes the person feel better and improves the physical fitness and elevates the mood. Once the individual learns particular Yoga techniques, which help in Diabetes management, they can practice it at home or at any other calm and comfortable place.

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Journal of Community Guidance & Research
2020 Vol. 37 No. 2 PP. 224-237
ISSN-0970-1346

PSYCHOLOGICAL WELLBEING OF DIABETIC PATIENTS

Sofiya Thomas

Abstract

Psychological wellbeing is an inter and inter-intra individual levels of positive functioning. It has a remarkable role in an individual's psychological health. It significantly contributes to both physical and mental functioning of an individual. Since the Diabetes is one of the chronic illnesses, it cannot be completely cured but can be managed. So it is important for the individuals with diabetes to enhance their psychological wellbeing. This review aims to understand the biopsychosocial factors and needs of individuals with diabetes and various interventions for enhancing their psychological wellbeing.

Introduction

Psychological well-being refers to inter-intra individual levels of positive functioning that can include one's relatedness with others and self-referent attitudes that include one's sense of mastery and personal growth (Richard, 2018). It is linked to positive mental health. Research has shown that psychological well-being develops through a combination of emotional regulation, personality traits, self identity and life experience. According to Straume and Vitterso (2012) overall wellbeing is thought to consist of both hedonic and eudaimonic aspects. Psychological Wellbeing (PWB) has its foundations on Eudaimonic aspects, which focus on concepts such as purpose in life, growth and meaning, while hedonia, which is based upon SWB (Subjective Wellbeing), consists of satisfaction in life and high positive affect combined with low negative effect.

Approaches for measuring Psychological wellbeing can be based on the individual's perception of meaning in life which is defined by their own unique potential and

❑ ***Sofiya Thomas*** *is a Post Graduate in Health Psychology, Central University of Hyderabad.*

on the ability to strive towards excellence in fulfilling this idea. There are six domains of psychological wellbeing; those are Self acceptance, positive relatedness, Autonomy, environmental mastery, Purpose in life and Personal growth.

Self acceptance is a fundamental feature of mental health and an element of optimal functioning (Ryff, 1989b). People who possess high level of self acceptance show positive attitudes towards their self and accept both strengths and weaknesses of their self. They always try to learn from their past mistakes instead of cursing themselves and others. People with low level of self acceptance show dissatisfaction with their life and they are also not willing to accept their certain personal qualities and feel regret on mistakes they have done in their past. Positive relatedness is the quality of an individual to understand the give and take of human relationships, maintain warm and trustworthy relationships and they belong well to a network of communication and support (Ryff, 1989b). They show concern about other's welfare and feel strong empathy, intimacy and affection. People who do not have this quality end up with interpersonal conflicts and feel isolated in their relationships because of the lack of ability to maintain warm and trustworthy relationships. Autonomy is the regulation of one's own behavior through an internal locus of control (Ryff, 1989b). People with high level of autonomy are independent and self-determined and they are able to think and act in their own way by analyzing the issues and both internal and external pressures. Whereas people with low level of autonomy show concern about the expectations, judgments, evaluations and decisions of others, think and act from others' perspective. Environmental mastery is an individual's to master or control over their external activities and makes effective use of surrounding opportunities. People who don't have this quality face difficulty in managing day to day affairs, unable to use surrounding opportunities effectively and possess lack of sense of control over their external world. People who have sense of purpose in life hold beliefs which help them to lead a meaningful life. Lack of sense of purpose in life may not help the person to lead a goal directed life. They are unable hold beliefs and to see any purpose not

only in their past but also in present life. People with a sense of personal growth have the ability to see their self as growing and expanding, to self actualize, accomplish their goals (Ryff, 1989b) and they are open to experience. They continue their personal development by realizing their inner potentials and see improvement in self and behavior over time. People who lack sense of personal growth are not much open to experiences and feel bored and uninterested in life. They are not trying to understand their inner potentials and not developing positive attitudes towards life.

Biopsychosocial Factors and Needs of Diabetic Patients

Diabetes or diabetes Mellitus (DM) is the most common major disease of the endocrine pancreas. This medical condition cannot be cured completely but can be managed or controlled. There are three types of Diabetes Mellitus includes Type 1, Type 2 and Gestational Diabetes Mellitus. Type 1 Diabetes Mellitus (Insulin Dependent Diabetes Mellitus (IDDM)) is caused by little or no insulin production by pancreas. It usually affects children and young adults before age 25 and requires insulin injection daily. Type 2 Diabetes Mellitus is characterized by insulin resistance and impaired insulin secretion. It was formerly known as noninsulin-dependent diabetes mellitus (NIDDM) or Adult-Onset Diabetes Mellitus. This is the most common form of Diabetes.

For the better understanding of psychological wellbeing of the diabetic patients, it is mandatory to go through their biological, psychological and social factors and needs which contribute to their psychological wellbeing.

Obesity especially abdominal obesity and Body Mass Index (BMI) are found to be associated with increasing prevalence of Type 2 Diabetes (Sachdev et al., 2009). Few studies also show that waist circumference or waist to hip ratio indicates the increased risk of developing Diabetes than the level of BMI (Chan et al., 1994; Boyko et al., 2000).According to Mohan et al., (2003), individuals who follow sedentary lifestyle are more prone to develop Diabetes Mellitus compared to individuals who regularly follow physical activity. Glucose tolerance and insulin sensitivity can be modified by the amount and quality of dietary food. High level of fat content in diet can results in impaired glucose transplant, reduced glucose

tolerance, decreased glycogen syntheses and accumulation of triglycerides in skeletal muscles (Pan et al., 1997).

Stress triggers the Hythothalamus-Pituitary-Adrenal (HPA) Axis and Sympathetic Nervous System (SNS), which leads to the secretion of Cortisol and Catecholamine (epinephrine and norepinephine). Secretion of these hormones can cause physiological, psychological and behavioral changes in an individual. Diseases such as autoimmune disorders, substance abuse, obesity, diabetes, depression and cardiovascular disorders can be caused by repeated firing of the Hypothalamus-Pituitary-Adrenal Axis and Sympathetic Nervous System. Chronic psychological stress and number of stressful events are positively correlated with the prevalence of Type 2 Diabetes Mellitus (Mooy et al., 2000; Kivimaki et al., 2015 & Nyberg et al., 2014). Job strain combined with high job demands and low job control (Nyberg et al., 2014; Karasek et al., 1990), long work hours (Kivimaki et al., 2015), perceived permanent stress at work place and at home (Novak et al., 2013) and high level of daily life stress (Toshihiro et al., 2008) have been found to have great influence on the development and the management of Diabetes. Virk et al., (2012) found that prenatal stress can have an elevated risk of future diabetes. In addition, there is growing evidence that chronic stress (physical, emotional and mental stress) and negative mood states are bidirectional associated with insulin resistance, glucose intolerance, central obesity, hypertension, dyslipidemia (Innese & Vincent, 2007).

Elevated depression symptoms as well as clinical depression are the most common psychological risk factor for increased prevalence of Diabetes Mellitus (Knol et al., 2006; Mezuk et al., 2008; Dimakakos et al., 2014; Pan et al., 2010). Depression in people with diabetes is often long-lasting and severe (Katon, 2008). Anxiety was also found to be a psychological factor associated with increased risk of developing Diabetes (Engum et al., 2007; Atlantics et al., 2012). People with diabetes were 20% more likely to have an anxiety condition at some point in their lifetime than those without diabetes (Li et al., 2008).It was also found that hostility trait can cause raised fasting glucose (Shen et al., 2008), insulin resistance (Suarez, 2006 &

Kawakami et al., 1995), and glycated hemoglobin (Zhang et al., 2006 & Kawakami et al., 1995) which lead to increased incidence of diabetes (Williams et al. 2011). Angry temperament has also been investigated in relation to development of diabetes (Golden et al., 2006 & Abraham et al., 2013). Another study found that adolescents with diabetes had significantly lower level perception on their personal health compared to adolescents without diabetes (Spezia Faulkner, 2003).

Following Self management regime helps the patient to keep their diabetic condition under control and they will be able to lead relatively normal life. People who believe that being diabetic is a serious condition are more likely to follow their self-management regime (Brownlee-Duffleck et al., 1987) and respond effectively to care interventions (O'Connor et al., 1997). Proper and adequate education regarding the causes, symptoms, prognosis, side effects of medication and the importance of following self management regime are helpful for the diabetic patients in better understanding of diabetes (Glasgow, 1985). A Study conducted by Shillitoe (1991) found that genetic counselling and providing adequate information regarding diabetic condition helped the patients and their families to have a better understanding about diabetes. Social support is another major social need of a diabetic patient. Jacobson et al. (2004) findings showed that adults with diabetes had few numbers of friends and less stress and intimacy in love affairs. In a study conducted by Kvam and Lyons (1991), few patients reported that lack of social support from family and friends badly affected both their diabetic condition and social life. So education about diabetes to the spouse and other family members is also having a great role in patient's adherence to self management regime (Dunn, 1993 & Shillitoe, 1991). A study done by Dunn (1993) also reported that Patient-Healthcare member (doctors, nurses and other members of health care system) relationship have an influence on patient's adherence to medication and self management. So it is evident that communication skills from both the doctor and patient are very important treatment of diabetes. Many participants in a study conducted by Neill and Evans (1998) believed that conducting awareness about diabetes among public would remove the stigma regarding diabetes and individuals

with diabetes might experience less pressure in their social life. They also reported need of access to healthcare professionals with counselling skills for both expressing their biopsychosocial concerns regarding diabetes and also for better understanding of self management regime.

There are many biopsychosocial factors affecting the diabetic condition. Sedentary life style, unhealthy diet patterns and obesity plays as biological factors in the development and prognosis of diabetic condition. The poor psychological health of an individual such as stressful experiences, depression, hostility, anger, no adherence to medication and other negative emotions also results in diabetic condition. Social life is also as important as the physical and psychological health of a diabetic individual. Education regarding the causes, complications and management of diabetes, social support and healthy patient-healthcare professional relationship also has significant role in diabetic condition.

Interventions for Enhancing Psychological wellbeing in Diabetic Patients

Psychological well-being can increase with age, education, extraversion and consciousness and decreases with neuroticism. Level of one's psychological wellbeing can be influenced by their physical health too. So both physical health and mental health are the two sides of a coin. Psychological interventions such as psycho education, cognitive behavioral therapy, counseling, family therapy, behavioral therapy, mind body interventions and relaxation techniques can be used to improve one's psychological wellbeing. Being diagnosed with diabetes imposes a life-long psychological burden on the person and his/her family. Naess, Midtjhell, Moum, Sorensen and Tambs (1995) showed that the psychological well being of diabetic patients was found to be signiûcantly poorer than that of those without diabetes. Monitoring for psychological well being, detecting psychological problems, and discussing and treating this facet of disease should improve clinical outcomes. Effective ways of handling biopsychosocial needs and factors of diabetic condition will have a great impact on psychological wellbeing of the patients. Positive affect has been prospectively and independently linked to lower mortality among those with Type 2 Diabetes (Mosknowitz, 2008).

1. Physical Exercises

Diabetic patients usually experience tiredness and it affects their willingness to perform any type of physical exercises. But performing even a very mild exercise has significant therapeutic effect on their both physiological and psychological health (Zimmet, 1997). Diabetic patients who received adequate advice and guidance in ways of including physical exercises in to their daily routine were found to be more likely to follow self management regime (O'Connor et al., 1997) and experienced better psychological wellbeing (Thirumalesh and Chandraiah, 2017). Positive affect and optimism have been found to have a greater effect on physical activity, healthier diet and reduced smoking (Mosknowitz, 2008). Such improvements in health behavior may be caused by easier initiation of physical activity, greater confidence in meeting diet and activity goals, and more vitality/ energy to engage in self-management when experiencing positive mood (Huffman et al., 2015).

2. Psychoeducation

Psycho education about diabetes and it's complications also had a great impact on emotional wellbeing, improved self efficacy and decreased anxiety and depression (Rubin, Peyrot and Saudek, 1989). Patient's education is a key to patient's empowerment, and it can be achieved through various intervention strategies which help the patient in taking decisions, goal setting, choosing therapeutic methods and health care behaviours

3. Behavioural Interventions

Behavioral Interventions found to have positive impact on patient's social relationships, experienced decreased stressful situations, and improved self-care behaviors, lower risk of other health complications and better quality of life (Delamater et al., 2001). Grey et al. (1998) found in a study that the group received Coping Skills Training (CST) showed high level of self efficacy, lowered upset regarding coping with complication of diabetes and better quality of life and improved social interaction compared to the group received intensive management alone. The emotional focused coping skill training deals with the unrealistic expectations regarding self care (Wolf et al., 2004) (for example, I will never overeat; I will do exercises and follow my diet pattern everyday). Failure in such

expectations may result in self-blame, guilt and even to depression. Problem Solving Therapy was also found to have an impact of reducing depression and effective copying skill among women with diabetes. (Hoseini, Azkhosha &Younesi, 2014)

4. Cognitive Behavioural Therapy

Cognitive Behavioural Therapy is used in diabetes treatment to enhance their psychological health. It helps in dealing with their irrational thoughts related to diabetic condition and its complications, declined motivation to medication adherence and physical exercises and reduced self care. Safren et al. (2014) conducted a study to identify the impact of cognitive behavioural therapy on adherence and depression among uncontrolled type 2 diabetes patients. They found CBT as helpful in reducing depression and improving adherence to medication. Since the depression is linked with self-efficacy and the sense of mastery (Van Der Van et al., 2003 & Steunenberg et al., 2007), lowered depression results in better experience of self efficacy and improved sense of mastery. Many other studies have also identified the effectiveness of CBT on reducing depression (Van Bastelaar et al., 2010 & Kulzer et al., 2014), better medication adherence by reducing symptoms of depression (Safren et al., 2009 & Markowitz et al., 2012). Self talk as a part of CBT has great effect on dealing with emotional distress in diabetic patients. Since motivation is an important part in self care and adherence, Motivational Interviewing is helpful in enhancing self care (Smith et al., 1997 & Knight et al., 2006) by analysing the need for doing so.

5. Stress Management

Stress management training can be helpful in delaying with the biopsychosocial complications among diabetic individuals. Grey et al. (1998) found that stress management has an important role in reduction of diabetes related stress and improved social interactions. In a study conducted by Lane et al. (1993) highly anxious type 2 diabetes individuals benefited from Progressive Muscle Relaxation, one of the stress management techniques. Stressful management technique was also useful in decreasing depression, anxiety and stress in diabetic women (Hamid, 2011) and increase of mental health of patients.

6. Mind-body Intervention

Mind-body interventions utilize the mind's capacity to affect the body and its physiological responses. Mind-body interventions include guided imagery, biofeedback, clinical hypnosis, yoga, expressive arts therapies and mindfulness meditation. Yoga has significant impact on increased general wellbeing among diabetic patients (Sharma et al., 2008 & Kasouri et al., 2009). Yoga is most often associated with physical postures (asanas), breathing techniques (pranayama), and meditation (dyana) (De Michaelis, 2005; Feuerstein, 1998). Singh et al., (2001) found in their study that Yoga asanas have an impact on relieving stress and improvement in their day to day performance. Practicing combination of both Asanas and Pranayama resulted in developed sense of wellbeing, alertness and attentiveness (Malhotra et al., 2004), reduction in anxiety and improvement in subjective well-being (Kumar et al., 2012). A study included Asanas, Pranayama and Meditation showed that it has significant impact on psychological wellbeing among individuals with diabetes (Jogsan, 2009). Meditation along was found to have results in greater acceptance of current living condition among diabetic individuals (Rungreangkulkij et al., 2011).

7. Social Support

Social support is considered as one of the basic functional content of any relationships. It plays a great role in the self care (Chew, Khoo and Chia, 2015; Stopford, Winkley and Ismail, 2013 & Gillibrand and Stevenson, 2006) Diet (Wen, Shepherd and Parchman, 2004; Lioyd et al. & Glassgow et al., 1999) and adherence to medication (DiMatteo, 2004) of diabetic patients. Increased social support also caused decrease in perceived stress levels (Zamani-Alavijeh et al.,2018), increased self esteem and self efficacy and depression (Miller and DiMatteo, 2013& Pinar et al.,2003). It is also found to have an impact on Quality of life (Ersoy-Kart and Guldo, 2005) and better health (Berkman, 1995; Bovier, Chamot and Perneger, 2004; Miyazaki et al., 2003 & McNicholas, 2002).

Conclusion

Psychological wellbeing of an individual plays an important role in the better prognosis of diabetes condition. Since the diabetic condition cannot be cured but can

be managed, considering their biological, psychological and social factors will have significant positive results in life of individual with diabetes. Maintaining healthy Body Mass Index, performing physical exercises, following healthy diet patterns, experiencing positive emotions, adherence to medication, adequate education regarding their condition, better social support and having healthy patient-healthcare professional relationships are contributing to better diabetic management. Many studies have done on the effectiveness of various interventions in diabetes condition. It is evident that Physical exercises, Psychoeducation, Behavioural Therapies, Coping Skill Training and Emotional focused Coping Skill Training, Problem Solving Therapies, Cognitive Behavioural Therapies, Motivational Interviewing, Mind Body Interventions and Social support having crucial role in improving psychological wellbeing and overall quality of life of individuals with diabetes.

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