The International Journal of Indian Psychology
ISSN 2348-5396 (e) | ISSN: 2349-3429 (p)
Volume 7, Issue 4, DIP: 18.01.018/20190704
DOI: 10.25215/0704.018
http://www.ijip.in | October- December, 2019

The International Journal of INDIAN PSYCHOLOGY

Research Paper

Effectiveness of counselling intervention on stress reduction and managing glycaemic level among patients with type 2 diabetes: pre-post intervention

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ABSTRACT

Present study intends to investigate effectiveness of counseling intervention on stress reduction and managing glycaemic level among type 2 diabetes patients. A sample of 40 middle adulthood (21 males and 19 females) aged between 40-65 years, type 2 diabetes patients was selected from Sanjoe hospital, Perumbavr. The tools used in the study are personal identification data, perceived stress scale, stress profile questionnaire, and problem area in diabetes questionnaire for measuring diabetes distress. Descriptive statistics like Mean, Standard deviation, Percentage and Frequency were used. Paired sample't' test was used to analyze the data. From the statistical analysis the investigator conclude that the counseling intervention was able to reduce stress and brought about a better management of glycaemic level. Thus the study implies the importance of diabetes awareness education and counseling in managing the blood glucose level. Life style modifications in individuals, especially in diet, physical activity and self-monitoring brought changes in stress and Glycaemic level. Better knowledge about diabetes provided by counseling itself reduced the diabetes distress. Educational programs showed a progress through stage of change in participants, motivational classes play a pivotal role. A non - pharmacologic intervention in individuals with type 2 diabetes could possibly improve measures of better glycaemic control and stress reduction.

Keywords: *Counselling Intervention, Stress Reduction, Glycaemic Level, Type 2 Diabetes*

Diabetes - an old disease, but many new remedies. Medical descriptions of diabetes date back to at least 1500 B.C., more than 3500 years ago. Writings from ancient cultures in China and the Middle East describe the classic signs of diabetes, such as passing large quantities of urine through the body. The ancient Greeks gave us the name diabetes, which means "to flow through". Later the Latin word mellitus (meaning sweet urine) was added to form the present medical name Diabetes Mellitus. Physicians actually diagnosed diabetes in ancient times by tasting the urine, but modern physicians have developed newer methods to accomplish this.

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Received: September 18, 2019; Revision Received: October 23, 2019; Accepted: December 25, 2019

Until recent times, people with diabetes could use only diet, exercise, or weight control for treatment. But in 1921, a major breakthrough occurred that changed the outlook and saved the lives of millions of individuals with diabetes 'insulin' was discovered. Research in diabetes has continued to make major strides. In the late 1970s self -monitoring of blood glucose became available, which helped in controlling one's blood glucose and thus can prevent or slow the progression of long-term complications of diabetes. The list of advances in diabetes management goes on and on, and all of them help you to gain increased control of your diabetes and thus reduce the risk of developing complications.

Type 2 Diabetes Mellitus is sometimes described as a life style disease, because it is more common in people who don't do enough physical activityy, and who are overweight or obese. In Kerala, the prevalence of life style diseases like diabetes, heart diseases, high blood pressure and obesity is high and it result in very high mortality and morbidity from malignant heart diseases. With the changing priorities and hectic lifestyle it becomes pretty obvious that, chances of getting metabolic diseases are higher.

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia (high blood glucose level) result in from defects in insulin secretion, insulin action or both. The chronic hyperglycemia is associated with long term damage, cardiac dysfunction and organ failure especially of eyes, kidneys, nerves, heart and blood vessels. The vast majority of cases of diabetes fall into two broad etiopathogenetic categories, which includes- Type 1 diabetes - absolute deficiency of insulin secretion, and Type 2 diabetes - combination of insulin resistance and inadequate compensatory insulin secretary response (relative insulin deficiency).

Type 2 diabetes is the more common form of diabetes. About 90-95% of people diagnosed with diabetes have Type 2. With type 2 diabetes, the cells don't respond to insulin properly and the pancreas does not produce enough insulin for the body's increased needs. If the insulin cannot do its job, the glucose channels do not open properly .Glucose builds up in the blood instead of getting into cells for energy. High blood glucose levels (hyperglycemia) over time can cause damage to various parts of the body; these are referred to as diabetes complications.

Both genetics and environmental factors influence in developing Diabetes Mellitus, in which genetics plays an important role in determining who develops Type 2 Diabetes.ie this type of diabetes "runs" in families. The major risk factors for prediabetes and type 2 diabetes are, weight, (the more fatty tissue you have ,the more resistance your cells become to insulin) inactivity, family history, race, age (your risk increases as you get older),gestational diabetes, polycystic ovary syndrome, high blood pressure and abnormal cholesterol and triglyceride levels. It is very important to discover diabetes as early as possible. If left untreated or uncontrolled, it can lead to serious health problems. Diabetes is a chronic condition that requires treatment for a life time. According to WHO estimates, more than 346million people worldwide have diabetes which is likely to double by 2030. We are fortunate today that to have better methods and medications to help in managing diabetes.

Even though diabetes is a well known illness, its treatment and management remain least practiced. The main challenge for the clinician is in, not only explaining the treatment, but also motivating the patient to live with the treatment and helping him psychologically to cope with life.

The aim of counselling in diabetes management is to help patients accept the diagnosis, know its implications, understand the importance of self-care and life-style modifications, comply with clinician advice and most importantly, have a positive approach towards their life and their treatment. Timely counselling intervention can play a vital role in enabling a patient to lead a good quality of life, and in turn delay disease progression and onset of complications.

Chronic hyperglycemia causes the patient to undergo treatment at the hospital for the management of blood sugar levels and complaints arising from disease that accompany it, this situation often makes patients in physical and mental stress , this can lead to increased blood sugar levels . In times of stress the body will release hormones such as cortisol, catecholamine, glucagon and growth hormones. All these hormones increases blood glucose levels.

In recent years, the complexities of the relationship between stress and diabetes have become well known but have been less well researched. Some studies have suggested that stressful experiences might affect the onset and /or the metabolic control of diabetes, but findings have often been inconclusive. The stresses of everyday life can negatively affect your diabetes .Emotional stress from tense circumstances at home or work can rise or lower blood glucose levels. There are two basic ways this can happen, Stress hormones can be released in your body, causing blood glucose levels to fluctuate. Stressful situations can cause you to change key behaviors upsetting your daily routine and making it harder to care for your diabetes. Stress is often a frame of mind, result from being attached to the results of our labor, the feeling that we need to be in control. When we are not in control, it causes stress.

According to Hans Selye, (1978) who spent 50 years doing stress research, came to the conclusion that it is not what stresses us that counts, it is the way we react, yes exactly our perception matters the most and it is known as perceived stress. Our physiological reactions are related to how much of a threat we perceive ourselves to be in and how much control we believe we have over the situation .When we perceive our trouble as more threatening than challenging ,or our capacity to cope as more hopeless than promising ,the physiological changes that result may lead to illness. Long term stress or chronic stress is the response to emotional pressure suffered for a prolonged period of time in which an individual perceives he or she has little or no control .It involves an endocrine system response in which corticosteroids are released.

All might try to avoid stress to offset its effects, but it's not always possible to do this, so you might try to anticipate and prepare yourself to handle the stressful situations. If stress becomes overwhelming, you may wish to try counselling. It is well documented that most people living with diabetes find it difficult to adhere to the daily demands of the diabetes medical regimen. Specifically, the regimen is demanding and unpleasant, factors outside the patients control often affect glycaemic control, and the avoidance of the diabetes-related complications cannot be guaranteed. It is paradoxical that although it is widely recognized that the treatment demands placed on the person with diabetes are complex and burdensome, many clinicians, family members, and patients themselves expect perfect adherence to this regimen. This expectation of perfectionism has been documented as one of the primary causes of noncompliance and diabetes burnout.

It has recently been recognized that the patient's "readiness to change '' influences the process of coping with demands of diabetes. The Trans theoretical model of Prochaska et al

(1977) may provide a cognitive measure of motivation to change. This model integrates key constructs into a comprehensive theory of change that can be applied to a variety of behaviours, populations and settings. A better understanding of the process of change triggered by an intervention and , in turn ,the relative success of its specific elements would help design successful ,cost -effective lifestyle programs to prevent disease or reduce complications. Many diabetes centers have professional counsellors; they are trained to help people with diabetes handle stresses that can impinge on good diabetes management. It will be helpful if the counsellor that you see has some understanding of diabetes.

Kerala is the diabetes capital of India with a prevalence of diabetes as high as 20% ─ double the national average of 8%. But a recently concluded study on 12,000 adults in Kerala by Sri Chitra Tirunal Institute of Medical Science and Technology (2017) showed that one in five adults had diabetes. Nearly six per cent people with diabetes could have the diseases under control. In Kerala, there is a high burden of pre-diabetes also which in addition to leading to diabetes also increases the risk for heart disease. In the age group of 45 to 69 years nearly two third (67.7%) had either diabetes or pre-diabetes. Unlike in other countries, high cholesterol and high blood sugar levels seem to be intertwined in Kerala, with increasing cholesterol levels as blood sugar levels increase. Diabetic subjects have cholesterol levels 17 mg/dL higher than nondiabetics. This association further underscores the crucial role of saturated fat as the "common soil" for diabetes, high cholesterol, and heart diseases.

"Diabetes is much higher in Kerala than in other states with prevalence of 19.4%. Also we have seen that there is no urban-rural divide when it comes to diabetes in the state. If we don't act on this serious problem, then we are heading towards big trouble," said Thankappan (2017), Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram, author of a study on the "Pattern, correlates and implications of non-communicable disease multi morbidity among older adults in

Selected Indian states: a cross-sectional study". The largest impediment against the prevention of diabetes is the attitude of people. Healthy lifestyle can prevent diabetes in up to 70% population. The state has to ensure community participation, build infrastructure and bring in due legislation that helps in the fight against diabetes," said Sreejith (2017) diabetologist.

Diabetes is a chronic disease that affects the patient physically, psychologically, socially, spiritually, cognitively, and economically .It requires a careful balance of activities, 24-hour-a-day management, and significant lifestyle changes. Living well with diabetes means combining a lifelong commitment to maintaining a lifestyle that balances sound nutritional, activity, and overall health habits with adherence to a strict medical-management regimen. Patients with diabetes live with it all day, every day. The person's self-esteem, sense of independence, and self-image all experience enormous strain as his or her lifestyle undergoes significant modifications and alterations. Providing systems ,process, and supports that assist the patient to learn self-management of diabetes is an important factor in the health care plan.Diabetes prevalence is rapidly increasing and it requires life time treatment with medications , regular health care follow-up for surveillance and prevention of complication ,and ongoing lifestyle counseling without effective treatment ,patients may experience short-term complications (such as severe hyperglycemia) or develop long term complications of the disease ,such as cardiovascular disease, renal failure, peripheral neuropathy and blindness.

Effectiveness of counselling intervention on stress reduction and managing glycaemic level among patients with type 2 diabetes: pre-post intervention

Most cases are type 2 diabetes, which covers 90 % of the population of Diabetes Mellitus (DM). In type 2 diabetes mellitus, there are two major problems associated with insulin, I.e. insulin resistance and deficiency of insulin. Insulin is a hormone, which is essential in order to use foods we eat correctly, and also for other important body processes. It is made in organ called pancreas, it contains several group of cells called islets of Langerhans. These islets are clusters of various types of cells. The most important are the beta cells -the tiny factories that make insulin, it also has alpha cells producing glucagon, which has the opposite action of insulin. After a meal, insulin is released which suppresses glycogenesis and promoting glycogen synthesis and storage also promotes the peripheral uptake of glucose, particularly in skeletal muscle and encourages storage and protein synthesis. Glucagon raises blood glucose levels, by breaking down the stored glycogen in liver and muscles into glucose .The balance between insulin and glucagon keeps blood glucose levels in the normal. Diabetes is caused by a breakdown in this normal processes described above. This can occur because the body produces little or no insulin, or because cells are resistant to the action of insulin.

Primary treatment of type 2 diabetes is to lose weight because insulin resistance is associated with obesity .Exercise is an essential element also to raise the effectiveness of insulin. Oral hypoglycemic drug can be added if diet and exercise do not successfully control blood sugar levels.

According to Soegondo (2016) there are five pillars of the management of Diabetes Mellitus in Indonesia, which include 1. Diet 2. Physical exercise 3. Drugs 4. Education and counseling. 5. Self-monitoring of blood sugar.

Diabetes mellitus is often called a 'silent killer'. Chronic hyperglycemia causes the patient to undergo treatment at the hospital for the management of blood sugar levels and complaints arising from diseases that accompany it, this situation often makes patients in physical and mental stress, and this can lead to increased blood sugar levels. In times of stress the body will release hormone such as cortisol, catechol amines glucagon and growth hormone. All four of these hormones increase blood sugar levels and the amount of energy a lot more.

Relaxation training is needed to lower blood sugar levels or suppress the secretion of cortisol, controlling negative emotions and controlling diet. Stressfulness can cause increase in secretion of stress hormones such as epinephrine, glucagon, cortisol and cause hyperglycemia. So the stress caused by day to day life , health related distress ,midlife crisis /tensions and a good control over the blood glucose ,these all are attained by the effect of counseling intervention with progressive muscle relaxation.

World is moving over from pharmacotherapy to a more patient -centric treatment approach ,where in the patient 's will is of prime importance .Relying on counseling is on one’s own will power. Counseling is provided for a patient as a help to help himself .It brings in confidence and awareness, that brings in will power and we all know that "where there is a will there is a way ". Effective Type-2 Diabetes control requires optimal self-management, including the ability to adhere to treatment and medication recommendations, eat healthily, engage in regular exercise, attend health checks and, in some cases, self-monitor the level of blood glucose.

Both education about diabetes and the care of one’s diabetes should be seen as a continuous, ongoing process that evolves as one gains experience and new perspective

REVIEW OF LITERATURE

Review of literature is an integral part of any research study. It can be defined as systematic identification and location of documents concerning information related to the research problem. The present research problem is, Effectiveness of Counseling Intervention on Stress Reduction and Managing Glycaemic level among type 2 diabetes patients. . Direct and indirect studies related to managing stress and Glycaemic level among type 2 diabetes patients are reviewed. As research does not take place in a vacuum all research studies are essentially linked to studies carried out in the past.

Chew, Vos, Heijmans, Metzendrof, Scholten, and Rutten (2015) conducted study on Psychological Interventions for Diabetes – related Distress in adults with Type 2 Diabetes Mellitus. Psychological Interventions and Relaxation therapy for type 2 diabetes people with distress and anxiety, showed improved diabetes related distress and general health enhancement and self- management.

Xie and Deng (2017) conducted study on Psychological Intervention for patients with Type 2 Diabetes Mellitus and Comorbid Depression: a meta-analysis of randomized controlled trials. The Psychological Intervention was effective on Type 2 Diabetes with stress, depression, anxiety and also indicated a better improvement of glycaemic control.

Ismail, winkey, and Rebe-Hesketh (2004) conducted a study on Systematic review and meta-analysis of randomized controlled trials of psychological interventions to improve glycemic control in patients with type 2 diabetes. There were non-significant differences in blood glucose concentration and also found Psychological distress was significantly lower in the intervention groups. In type 2 diabetes, there are improvements in long-term glycemic control and psychological distress but not in weight control or blood glucose concentration in people who receive psychological therapies.

Kirk, Matrie, Maelntyre and Fisher (2004) conducted study on Effects of a 12-month physical activity counselling intervention on glycaemic control and on the status of cardiovascular risk factors in people with Type 2 diabetes. Significant differences between groups were recorded for physical activity after 6 and 12 months. The experimental group had increased levels of physical activity from baseline to 6 months , with no decrease from 6 to 12 months ,In the control group, accelerometer counts per week decreased from baseline to 12 months Between-group differences were recorded for the change in HbA1c ie improvements in glycaemic control , systolic blood pressure , and for fibrinogen from baseline to 6 months, and for total cholesterol from baseline to 12 months .Physical activity counseling was effective in promoting physical activity in people with Type 2 diabetes. The counselling improved glycaemic control as well as the status of cardiovascular risk factors in these patients.

Zimmermann, Thompson, & Perssell (2014) conducted study on Electronic health record identification of pre diabetes and an assessment of unmet counselling needs. EHR query using glucose measurements can identify pre-diabetic patient and that requiring further glucose metabolism evaluation, including those with undiagnosed diabetes. Future research should investigate EHR-based, population -level interventions to facilitate prediabetes recognition and counselling.

Hoffman, Sloane, Peterson, Howard, Pieper, &Morey (2010).The impact of self-reported arthritis and diabetes on response to a home-based physical activity counselling intervention. Results showed, a home -based PA intervention was effective in increasing PA in subjects with arthritis or arthritis plus diabetes. This programme may serve as a useful model to improve outcomes in older persons with these pervasive diseases,

Botomino, Bruppacher, Krahenbuhl, & Hersberger (2008) change of body weight and life style of persons at risk for diabetes after screening and counselling in pharmacies. Results showed that immediate counselling in community pharmacies after screening for type-2 diabetes can result in significant lifestyle change and weight loss in overweight individuals.

Poskiparta, Kasila, and Kiuru (2006) conducted study on Dietary and Physical activity counselling on Type-2 diabetes and impaired glucose tolerance by physicians and nurses in primary health care in Finland. Results showed physicians and nurses spent little time on dietary and physical activity counselling. In health care settings, education and training are required to develop the communication skills of health professionals in all aspects of preventive medicine.

Lindstrom (2006) conducted study on Sustained reduction in the incidence of Type-2 Diabetes by Life style intervention: follow-up of the Finnish Diabetes Prevention study. Results showed, life style intervention in people at high risk for type 2 diabetes resulted in sustained life style changes and a reduction in diabetes incidence, which remained after the individual life style counselling was stopped.

Partapsingh, Maharaj, and Rawlins (2011) conducted study on applying the stages of change model to Type -2 Diabetes care in Trinidad: A randomized trial. The result suggests a tendency to a worsening of glycaemic control in this population despite adopting more favourable SOC for diet and exercise. May be the harsh social conditions prevailing at the time of the study overrode the clinical intervention.

Centis, Trento, Cas, Pontiroli etal., (2014) conducted study on Stage of change and motivation to healthy diet and habitual physical activity in type-2 diabetes. Results showed that stage of change and motivation to adopt a healthier diet and increase their physical activity remain a problem in a large percentage of individuals with T2DM,irrespective of age and comorbidities.

Loyd, Smith, Weinger (2005) conducted study on Stress and Diabetes: A review of the links. In summary, research has indicated that stressful experiences have an impact on diabetes. Stress may play a role in the onset of diabetes; it can have a deleterious effect on glycaemic control and can affect life style.

Gron, Dalsugaard, Ribe et al. (2018) conducted study on Improving diabetes care among patients with severe mental illness. A systematic review of the effect of interventions. Non - pharmacologic interventions in individuals with SMI and T2DM could possibly improve measures of diabetes care, although with limited clinical impact.

METHODOLOGY

Participants

The sample of the present study comprise of 40 Type 2 diabetes mellitus patients with in the age group 40-65 years (middle adulthood), in the diabetic clinic of Sanjoe hospital . Patients

who don't complete the follow ups will be excluded from the study. Perceived stress scale (PSS), Problem Area in Diabetes (PAID) questionnaire and glucometer, gives the values /scores directing to the present status of the patient. The counselling intervention using stage of change theory are given to the sample with proper follow ups and monitoring**.** After three months of intervention, we expect a reduction in stress and improvement in glycaemic control in type 2 diabetes patient from diabetic clinic at Sanjoe hospital Perumbavoor under the guidance of the physician, ie a pre and post test was given to the same group. The glycaemic level of the patient's will be measured before and after the intervention with the help of a registered practitioner.

The participants included, patients who do regular check-up for type 2 diabetes at Sanjoe Hospital, the patients who are willing to undergo a behavioural change with life style modification with regular follow ups for three months and patients of both gender within the age group of 40-65 years are included. Excluded patients who are physically disabled and other handicaps will be excluded from the study ,those who do not come for regular follow ups and monitoring will be excluded, Patients with Type 1 diabetes are excluded from the study and the patients of both genders with the age group of below 40 and above 65 years will be excluded from the study.

Instruments / Tools

In the present study, questionnaire measures, counseling intervention (stages of change counseling) are the tools used for the collection of date and interventions. Which includes personal data schedule, comprised of socio-demographical information about the subjects such as age, sex, place of residence, and socioeconomic status (education and occupation), marital status, family type and clinical information regarding glycaemic level (FBS) etc.? It will be prepared by the investigator. The Perceived Stress Scale (PSS), developed by Sheldon Cohen in 1988, is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The 10 questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items.

Reliability and Validity

Psychometric properties of PSS were investigated by confirmatory factor analysis (construct validity), Cronbach's alpha (reliability), and by investigating relations with the DASS-21 scores and the number of symptoms, across individuals' characteristics. The two-factor structure of PSS-10 and PSS-14 was confirmed in our analysis. We found satisfactory Cronbach's alpha values (0.82 for the full scale) for PSS-14 and PSS-10 and marginal satisfactory values for PSS-4 (0.69). PSS score exhibited high correlation open access Int. J. Environ. Res. Public Health 2011, 8 3288 coefficients with DASS-21 subscales scores, meaning stress (r = 0.64), depression (r = 0.61), and anxiety (r = 0.54). The PSS (14-item) demonstrated adequate reliability (internal consistency, α= .81, and test-retest, r= .73), validity (concurrent), and sensitivity. Additional data indicate adequate reliability (α= .82, test-retest, r= .77), validity, and sensitivity of a 10-item short version of the PSS (Remor, 2006).

The Stress Profile

The stress profile is designed to identify those areas that help a person withstand the detrimental effects of daily stress and those that render one vulnerable to stress related illness. Conceptually, the stress profile is based on the cognitive -transactional approach to stress and coping developed by Lazarus and his colleagues (1981). A major goal in constructing the stress profile was to keep the total number of items that constitute the inventory small enough to encourage use in all types of settings, yet large enough to permit the reliable and valid assessment of a wide range of areas that moderate the relationship between stress and illness. At 123 items, the stress profile is quite easily manageable as a self-report instrument that can be completed in a reasonable amount of time; the majority can complete this in 25-30 minutes. For getting a general picture of the stress -related health - risk status of a specific group of respondents (here type 2 diabetes), the stress profile scores for the group may be treated as aggregate data. Here the mean and standard deviations for the entire group before and after intervention is compared and significance is tested with paired sample t- test.

Reliability and Validity

The stress profile consists of a number of questionnaire which have been developed to assess the severity of stress in fifteen areas of life: -Stress, Health habits (Exercise, Rest or sleep, Eating or Nutrition, Prevention), Social Support Network ,Type-A behaviour, Cognitive Hardiness, Coping Style (Positive Appraisal, Negative Appraisal, Threat Minimization, Problem Focus), Psychological well-Being . The questionnaires have been validated for test - retest reliability, the mean time elapsed between test and retest was three months. Among the different factor Type -A Behaviour and Cognitive Hardiness-showed moderately high test re-test re liabilities, ranging from 0.76 to 0.86. The stress profile has been used in several studies of concurrent validity. Only two scales of the stress profile -Type A Behaviour and Cognitive Hardiness -were utilized in the first of these studies, which was sponsored by the veterans Administration: 100 dental patients volunteered for a 10 week experimental study investigating the effects of cognitive -behavioural therapy on dental hygiene practices (Jacobs 1987). All patients participating completed the stress profile along with MBHI (Million Behavioural Health Inventory) and the results showed positive correlation. In addition to concurrent validity, there has done several studies using stress profile scores to predict the future status on measures of both physical and psychological health. All these findings provide substantial support for the predictive validity of the stress profile. Using the profile, the inter-relationships between stress areas can be assessed, appropriate treatments advised, and the response to treatment in relation to different components evaluated.

Problem area in diabetes (PAID)

It is a 20 questionnaire, which can be used to formally asses diabetes distress. Distress can be said as the inability to cope with stressful conditions, or a condition that is painful physically or mentally, that is observable in behavior .Diabetes can be demanding and cause stress and emotional distress. It is vital that clinicians are able to identify diabetes -related emotional distress in their patients. One tool that has proven very helpful to healthcare professionals is PAID scale, a simple one page questionnaire. Most patients can complete it in 5 minutes, and the results can be obtained in less than 2 minutes, therefore, patients and clinicians can complete the questionnaire and discuss the results at the same visit. The primary intervention to alleviate diabetes -related distress can be done through, counselling intervention (stages of change counseling) and progressive muscle relaxation technique (JPMR).

Reliability and Validity

Construct validity through confirmatory factor analysis (CFA) and Rasch analysis, concurrent validity through correlation with related scales (Kessler Psychological Distress Scale, Diabetes Health Profile-psychological distress, Audit of Diabetes Dependent Quality of Life), reliability through assessment of internal consistency and floor and ceiling effects, and sensitivity by estimating effect sizes for known clinical and social functioning groups. The abridged 16-item PAID mapped to a single latent trait, with a high degree of internal consistency (Cronbach α 0.95), but significant floor effect (24.6% scoring at floor). Both 20-item and 16-item PAID scores were moderately correlated with scores of related scales, and sensitive to differences in clinical and social functioning groups, with large effect sizes for glycaemic control and diabetes related complications, nephropathy and neuropathy **Materials**

Counselling Intervention (Stages of Change counselling -SOC)

The counseling intervention will be administered to the subjects in two times in a week, with a time period of three months. It consists of five identifiable stages through which patients pass: pre-contemplation, contemplation, preparation, action, and maintenance. The Trans theoretical model is also known by the abbreviation TTM and sometimes by the term "stages of change", although this latter term is correct since the stages of change are only one part of the model along with processes of change, levels of change, etc. Several help books – Changing for Good (1994), Changeology (2012), and Changing to Thrive (2016) and articles in the news media have discussed the model. It has been called "arguably the dominant model of health behavior change, having received unprecedented research attention, yet it has simultaneously attracted criticism.

The model illustrates that for the most persons a change in behavior occurs gradually ,with the patient moving from being uninterested ,unaware or unwilling to make a change (pre contemplation), to considering a change (contemplation), or deciding and preparing to make a change(preparation) ; genuine, determined action is then taken and over time , attempts to maintain the new behavior occur.

Stage 1: Precontemplation (not ready)

People at this stage do not intend to start the healthy behaviour in the near future (within 6 months), and may be unaware of the need to change. People here learn more about healthy behaviour: they are encouraged to think about the pros of changing their behaviour and to feel emotions about the effects of their negative behaviour on others. Precontemplators typically underestimate the pros of changing, overestimate the cons, and often are not aware of making such mistakes. One of the most effective steps that others can help with at this stage is to encourage them to become more mindful of their decision making and more conscious of the multiple benefits of changing an unhealthy behaviour.

Stage 2: Contemplation (getting ready)

At this stage, participants are intending to start the healthy behaviour within the next 6 months. While they are usually now more aware of the pros of changing, their cons are about equal to their Pros. This ambivalence about changing can cause them to keep putting off taking action. People here learn about the kind of person they could be if they changed their behaviour and learn more from people who behave in healthy ways. Others can influence and help effectively at this stage by encouraging them to work at reducing the cons of changing their behaviour.

Stage 3: Preparation (ready)
People at this stage are ready to start taking action within the next 30 days. They take small steps that they believe can help them make the healthy behaviour a part of their lives. For example, they tell their friends and family that they want to change their behaviour. People in this stage should be encouraged to seek support from friends they trust, tell people about their plan to change the way they act, and think about how they would feel if they behaved in a healthier way. Their number one concern is: when they act, will they fail? They learn that the better prepared they are, the more likely they are to keep progressing.

Stage 4: Action (current action)
People at this stage have changed their behaviour within the last 6 months and need to work hard to keep moving ahead. These participants need to learn how to strengthen their commitments to change and to fight urges to slip back. People in this stage progress by being taught techniques for keeping up their commitments such as substituting activities related to the unhealthy behaviour with positive ones, rewarding themselves for taking steps toward changing, and avoiding people and situations that tempt them to behave in unhealthy ways.

Stage 5: Maintenance (monitoring)
People at this stage changed their behaviour more than 6 months ago. It is important for people in this stage to be aware of situations that may tempt them to slip back into doing the unhealthy behaviour—particularly stressful situations.

It is recommended that people in this stage seek support from and talk with people whom they trust, spend time with people who behave in healthy ways, and remember to engage in healthy activities to cope with stress instead of relying on unhealthy behaviour. Relapse (recycling) Relapse in the TTM specifically applies to individuals who successfully quit smoking or using drugs or alcohol, only to resume these unhealthy behaviours. Individuals who attempt to quit highly addictive behaviours such as drug, alcohol, and tobacco use are at particularly high risk of a relapse. Achieving a long-term behaviour change often requires ongoing support from family members, a health coach, a physician, or another motivational source. Supportive literature and other resources can also be helpful to avoid a relapse from happening.

All assessments were based on patient self-reported data. Action stage for exercise was defined as a person being involved in physical activity of moderate intensity, 3-5 days a week for at least 30-45 minutes per day. Action stage for self-monitoring was defined as that person adhering to the proper self-checking of glycaemic level with glucometer and proper follow ups. Action stage for diet was assessed based on a person reporting use of a specific dietary plan for managing diabetes. The intervention was stage -specific and personalized, given care to type 2 diabetes patient according to their current stage of change and specific to the patient as a whole. Group sessions included classes by the dietician and diabetologist and play therapy to make the intervention more effective and use full. Recent studies have led to the conceptualization of this model as useful to treat patients with diabetes. It is a patient-centered approach that helps identify a person's readiness to change behavior and to them identify and prioritize self-management goals in diabetes.

Changes do not occur in a linear fashion but involve continual relapsing and reintroduction of changes. Strategies for change include consciousness-raising, self-reevaluation, stimulus control, reinforcement management and use of helping relationships. Strategies vary in

values, depending on the stage of the individual. Thus consciousness-raising may be extremely useful tool in beginning the process of change in the pre contemplation and contemplation stages; however it may not be sufficient to induce action. Additional strategies, such as reinforcement management, are important in taking action on the basis of awareness of the nature of the problem. Here we use SOC for managing diabetes by diet, physical activity and self-monitoring of glycaemic levels. The most direct implications of this model of stages and processes of change is the need to evaluate the patients stage of readiness to change and tailor interventions accordingly. The final results can be surprising with changes in life style with behavior change causing reduction in stress and improved glycaemic control in type2 diabetic patients.

Procedure for data collection

To undertake the study, the investigator approached the hospital administration and explained the purpose of the study. After obtaining permission, met each type 2 diabetes patients individually and in group. Average 4 or 5 cases were attended weekly individually and met twice in a week as group. The counselling process was conducted in 3 stages – Pretest, Intervention and Posttest. The various tools used to assess in pre-test and post-test, includes 1. Personal identification data, 2. Stress profile questionnaire, 3.PAID (Problem area in diabetes) questionnaire, 4.Perceived stress scale questionnaire and other unstructured questions to assess the stages of the participants. The glycaemic level before and after intervention was recorded with glucometer in the presence of diabetologist at the Sanjoe hospital.

The intervention given includes Progressive Muscle Relaxation Technique and counselling intervention (Stage of Change Model), these are the independent variables and level of stress, perceived stress, diabetes distress and glycaemic level are the dependent variables.

Pretest

After self-introduction and rapport built up, a brief explanation regarding the study was given. The tools were given to the subjects. They were assured about the confidentiality that the results will only be used for research purpose, so that they won't feel any apprehension and could freely give out the response. Doubts regarding questionnaire was clarified.

From the personal identification data , we got information about the age, sex, height, weight, BMI, socioeconomic status, family type, marital status and if patient is on any medication or not (for diabetes).

Stress profile gave us a clear picture regarding the level of stress among type 2 diabetes patients in various levels as the stress profile is designed to identify those areas that help a person withstand the detrimental effects of daily stress and those that render one vulnerable to stress related illness. Conceptually, the stress profile is based on the cognitive -transactional approach to stress and coping developed by Lazarus and his colleagues. A major goal in constructing the stress profile was to keep the total number of items that constitute the inventory small enough to encourage use in all types of settings, yet large enough to permit the reliable and valid assessment of a wide range of areas that moderate the relationship between stress and illness. At 123 items, the stress profile is quite easily manageable as a self-report instrument that can be completed in a reasonable amount of time. It provides information about specific life style and health behaviours that might be contributing to stress -related illness and disorders for a particular individual. The results only give us tentative

information not a definitive one and thus it is not designed to predict longevity or make medical diagnoses. The integration and direct sharing of the information contained in this report with the respondent is strongly encouraged in order to facilitate targeted treatment interventions and life style modifications.

PAID scale is a 20 questionnaire, which can be used to formally asses diabetes distress. Distress can be said as the inability to cope with stressful conditions, or a condition that is painful physically or mentally, that is observable in behavior .Diabetes can be demanding and cause stress and emotional distress. It is vital that clinicians are able to identify diabetes - related emotional distress in their patients. One tool that has proven very helpful to healthcare professionals is PAID scale, a simple one page questionnaire. The primary intervention to alleviate diabetes -related distress can be done through, counselling intervention (stages of change counseling) and progressive muscle relaxation technique (JPMR).

The Perceived Stress Scale (PSS), developed by Sheldon Cohen in 1988, is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The 10 questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way. PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items.

The counseling intervention was administered to the subjects in two times in a week, with a time period of three months, and those who missed the appointments were given personalized counselling separately at another time in the same week.It consists of five identifiable stages through which patients pass: pre-contemplation, contemplation, preparation, action, and maintenance. It is a patient -centered approach that helps identify a person's readiness to change behavior and to them identify and prioritize self-management goals in diabetes. The stage of change model has been evaluated in a number of contexts, and although not widely used to provide care for Type 2 diabetes, but it has been used to guide interventions for change in diet, physical activity and self-monitoring by which there can bring about positive changes in managing glycaemic level. All assessments were based on patient self-reported data. Action stage for exercise was defined as a person being involved in physical activity of moderate intensity, 3-5 days a week for at least 30-45 minutes per day. Action stage for self-monitoring was defined as that person adhering to the proper self-checking of glycaemic level with glucometer and proper follow ups. Action stage for diet was assessed based on a person reporting use of a specific dietary plan for managing diabetes. The intervention was stage -specific and personalized, given care to type 2 diabetes patient according to their current stage of change and specific to the patient as a whole. Group sessions included classes by the dietician and diabetologist and play therapy to make the intervention more effective and use full.

Jacobson's relaxation technique, also called progressive relaxation therapy, and was developed by Dr. Edmund Jacobson (1929) over half a century ago. Jacobson developed over 200 exercises and techniques which, taken together, relax the entire body by releasing muscular tension that accumulates as a person experiences a stressful situation. Jacobson, and those who have followed in his footsteps, claim that this technique will cure not only tight muscles and cramps, but also reduces the intensity of pain, and relieve stress and anxiety. In order to receive maximum benefit, it is recommended to practice this technique every day for

at least 20 minutes at the same time every day in a quiet, comfortable place. Jacobson founded the International Stress Management Association, which continues his work to this day. The International Stress Management Association (ISMA) produces publications and offers trainings in Jacobson's relaxation therapy. And as your body relaxes, so will your mind. The participants can combine deep breathing with progressive muscle relaxation for an additional level of relief from stress.

Post Test

Post test was conducted after 3 months of pretest. Among the patients in diabetic clinic, who was regular and followed the investigator was undergone a post-test evaluation

The tools were administered according to the instruction. Although instruction for responding to the scale was given, meaning and doubts about some statements was explained to the subject. No time limit was given, but told to complete the scale as fast as possible. Relevant information was also collected.

Scoring and Consolidation of Data

The answered tools were collected and scrutinized for the purpose of completeness and perfection before scoring. Response sheets were scored as per the scoring scheme for each tool. The scoring of the tests was done manually. The scores for the tests were entered into the SPSS data sheet so that further calculation can be made easily. The data were grouped into different categories and subjected to statistical analysis as per research questions.

Procedure

To undertake the study, the investigator approached the hospital administration and explained the purpose of the study. After obtaining permission, met each type 2 diabetes patients individually and in group. Average 4 or 5 cases were attended weekly individually and met twice in a week as group. The counselling process was conducted in 3 stages – Pretest, Intervention and Posttest. The various tools used to assess in pre-test and post-test, includes 1. Personal identification data, 2. Stress profile questionnaire, 3.PAID (Problem area in diabetes) questionnaire, 4.Perceived stress scale questionnaire and other unstructured questions to assess the stages of the participants. The glycaemic level before and after intervention was recorded with glucometer in the presence of diabetologist at the Sanjoe hospital.

The intervention given includes counselling intervention (Stage of Change Model), was the independent variables and level of stress, perceived stress, diabetes distress and glycaemic level are the dependent variables. The counselling process was conducted in 3 stages – Pretest, Intervention and Posttest. In the pre-test session, soon after self-introduction and rapport built up, a brief explanation regarding the study was given. The tools were given to the subjects. They were assured about the confidentiality that the results will only be used for research purpose, so that they won't feel any apprehension and could freely give out the response. Doubts regarding questionnaire was clarified. In the second session, counselling Interventions were given to the participants. However, eclectic counselling along with unstructured counselling Schedules was implemented. Post test was conducted after 3 months of pretest. Minimum 3 months of time gap was given to the participants. The tools were administered according to the instruction. Although instruction for responding to the scale was given, meaning and doubts about some statements was explained to the subject. No time limit was given, but told to complete the scale as fast as possible. Relevant information

was also collected. The answered tools were collected and scrutinized for the purpose of completeness and perfection before scoring. Response sheets were scored as per the scoring scheme for each tool. The scoring of the tests was done manually. The scores for the tests were entered into the SPSS data sheet so that further calculation can be made easily. The data were grouped into different categories and subjected to statistical analysis as per research questions.

Ethics and confidentiality

The research was conducted with the consent of the participants. The participants were assured about their confidentiality. Code numbers were used to protect the privacy of the participants. Also, the researchers stated to the participants that they could withdraw from the study at any time without any prejudice.

RESULTS AND DISCUSSION

The collected data is tabulated and strictly checked. Each item was appropriately coded and entered in the data sheet according to the identification code . The data obtained with the help of above mentioned questionnaires was analyzed using statistical methods. The statistical tests used for the purpose of the analysis of the collected data are descriptive statistics like percentages, frequency, mean, and standard deviation paired sample‘t’ Test.

The distribution of sample on the basis of BMI is described in the Figure 1. The percentage indicates predominant value as 25 (17.5%) and least is shown as 17, 30, and 33 with a 2.5%. BMI is calculated as weight in kg /height in meter square. The normal range is 18.5-24.9, over weight is 25-29.9 and obese is 30.0-34.9. So among our participants the most predominant comes under over weight category, so weight management has to be a major concern in the intervention. As we all know the obesity and sedentary lifestyle is the major issue for all the disease prevalence especially diabetes. As per report by Kelly et al.in 2005, the overweight and obese adults were 937 million and 396 million respectively worldwide and the figure has almost doubled in number in comparison to past 20 years. The incidence and prevalence of diabetes is 2-3 folds greater in urban than rural population. Life style changes including increased physical activity, reduced fat and increased fibre were found to be even more effective than medication in type 2 diabetes prevention. People with type 2 diabetes are often obese and have difficulty avoiding the consumption of saturated fats.

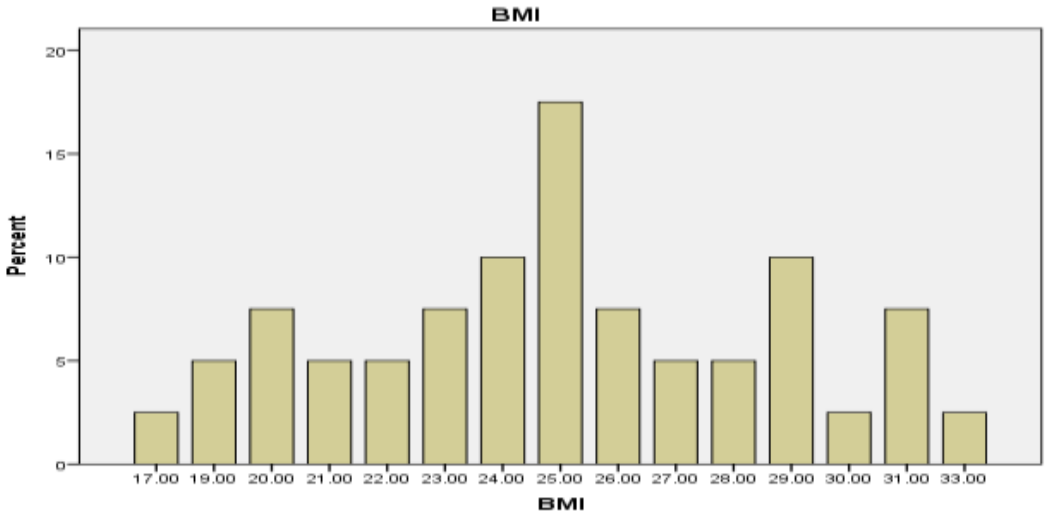

Figure 1: Distribution of participants based on BMI .

Major findings

1. There is reduction in stress after counselling intervention (Stage of Change model) among type 2 diabetes patients. the mean scores of level of stress has a difference in values before and after the task. It reveals that the mean score (423.77) of level of stress after intervention is higher when compared to mean score (383.80) of level of stress before intervention. However, higher score on aggregated stress profile scale suggest a relative invulnerability to stress-related illness. There is reduction in glycaemic levels after counselling intervention (Stage of Change model) among type 2 diabetes patients. Even though the counseling is not having direct effect on glycaemic level, better understanding provided by life style behavior modification in diet, exercise and self-monitoring along with better knowledge about diabetes had an impact which has to be the one among the major findings.
2. There is reduction in perceived stress after intervention (Stage of Change Model and Jacobson's Progressive Muscle Relaxation Technique among the type 2 diabetes patients. Both interventions had an effect on how we perceive and the change in perception by counseling and relaxation training lowered the value. It reveals that the mean score (14.63) of perceived stress after intervention is lower when compared to mean score (18.43) of Perceived Stress before intervention
3. There is reduction in diabetes distress after intervention (Stage of Change Model and Jacobson's Progressive Muscle Relaxation Technique among the type 2 diabetes patients. Diabetes-related distress has been found to be predictive of diabetes self-care behavior as well as blood glucose control. The mean scores of diabetic distress score have a difference in values before and after the task. It reveals that the mean score (22.03) of diabetic distress after intervention is lower when compared to mean score (26.08) of diabetic distress before intervention.
4. There is reduction in glycaemic levels after counselling intervention (Stage of Change model) among type 2 diabetes patients. Even though the counseling is not having direct effect on glycaemic level, better understanding provided by life style behavior modification in diet, exercise and self- monitoring along with better knowledge about diabetes had an impact which has to be the one among the major findings

The counselling intervention brought stage specific individual changes in participants which is shown in Figure 2,3 and 4

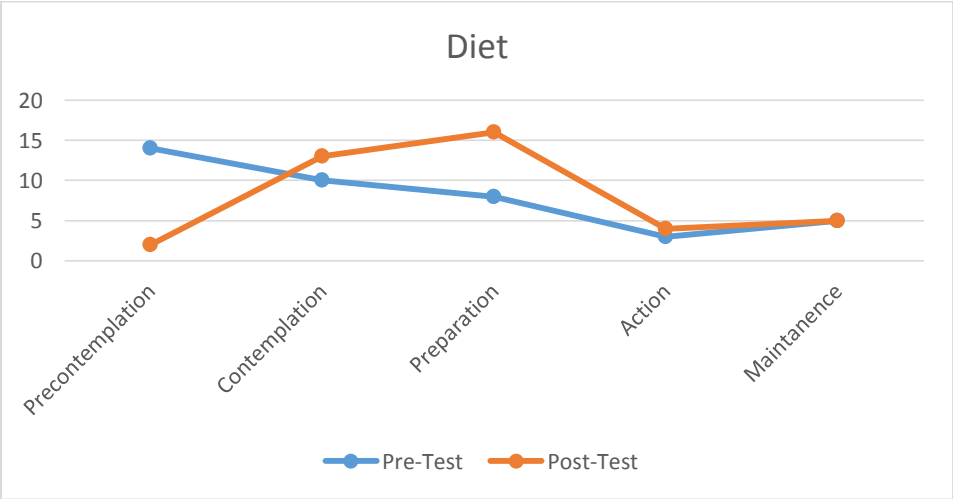

Figure 2 shows Stage of change model for Diet

From Figure 2 it shows before intervention, 14 participants were in precontemplation stage, 10 were in contemplation stage, 8 were in preparation stage, 3 were in action stage and 5 among them were in maintenance stage. After the intervention the changes in the specific stages noted include 2 among the 40 were only on the precontemplation stage, all the rest showed a willingness of change in their behaviour in order to have a better diabetic and stress control. 3 among them shifted to contemplation stage, 8 were shifted to preparation stage, and 1 among them shifted to action stage and 5 among them continued their maintenance stage.

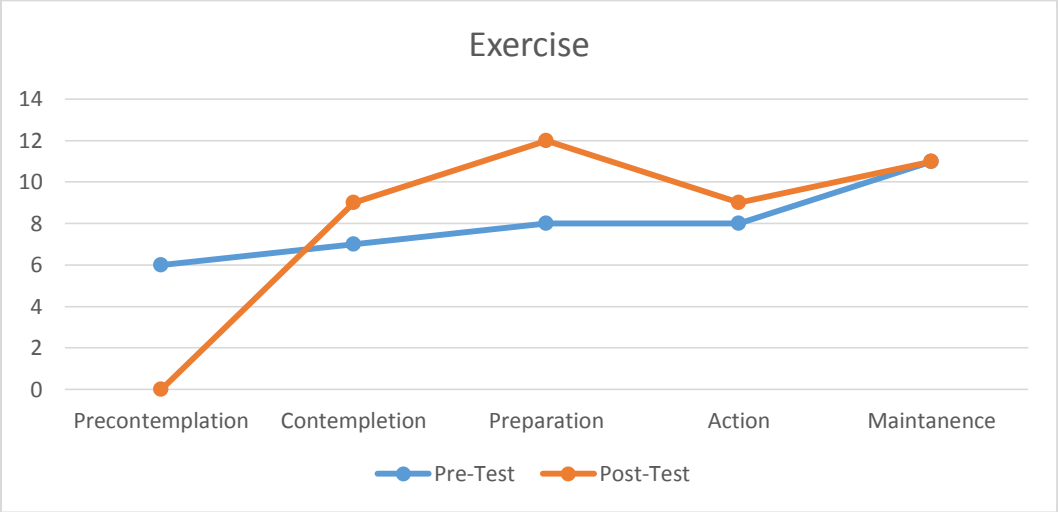

Figure 3 shows Stage of Change model for Exercise

From Figure 3 it indicates the graphical representation of stage of change model for exercise. Before the intervention 11 among the 40 were doing exercise regularly (maintenance stage), 8 among them was doing exercise for the last 3/4 months (action stage), and 8 among them will start the exercise in next month (preparation stage), 7 among them wishes to start but not able to do so (contemplation stage) and 6 among them were not interested to do the exercise (precontemplation stage). After the intervention none of them was in the precontemplation stage, 2 shifted to contemplation stage, 4 shifted to preparation stage one shifted to action stage.

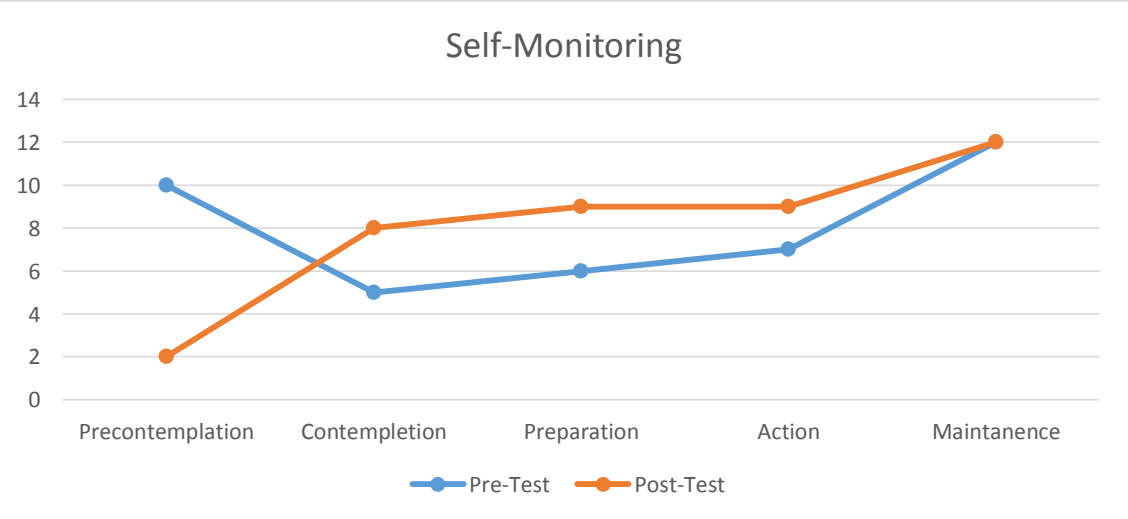

Figure 4 Shows Stage of Change model for Self-monitoring

From the Figure it shows before intervention 12 among the participants were doing the self-monitoring of their glycaemic level and regularly giving follow-ups for last few years (maintenance stage), 7 among them were doing the same since last 2 /3months (action stage), 6among them is ready to start with self-monitoring (preparation stage), 5 of them wish to do so (contemplation) and 10 among them was not at all aware of the importance of self - monitoring (precontemplation). After the intervention done for three months 2 among them was still not interested in self-monitoring, but 3 among them shifted to contemplation stage, 3 among shifted to preparation stage , 2 among shifted to action stage and 12 among was consistent with their self-monitoring.

DISCUSSION

A lifestyle modification is the golden principle behind the betterment of life. The significant changes in behaviors are brought about by Stage of Change counselling, which is a form of person-centered counselling. For that used semi-structured questions, as certain questions are always asked, but there is freedom to add questions. For bringing up the change you need to have 3 factors to consider, effort, commitment and better knowledge. There was conducted several awareness classes in to order bring about better knowledge about diabetes management. But the effort and commitment has to come from individual itself. Factors affecting attitude change includes. Source of communication, Content and characteristic of communication, Channel of communication and Characteristics of audience. Everyone need to ask themselves, whether they need to be a better person.

There should be a balance between mind body and character, which is the holistic approach. To be a better person change your thoughts, changes your actions changes your habit that changes your character which makes a better you and thus makes a better family, better society and better world to live. So to live with diabetes in a most comfortable way was learned by our study.

So by making the patients understand the need of diabetic management, with the help of health care providers, can make them live well with diabetes mellitus. Both the counselling interventions and progressive muscle relaxation can alleviate the living of diabetic patients. Diabetes management first starts with, learning more about diabetes .Understanding that each person with diabetes has different goals and targets and they should celebrate their achievements as they get closer to their own goals. Dream of a healthier you, great acts are performed not through strength but by perseverance.

During the last decade, the role of psychology in diabetes care has moved from a traditionally psychiatric or medical model to a social model, in which behavioural interventions in the form of telemedicine technology or behavioural strategies for optimizing self-management have been shown to improve biologic, psychological, and behavioural outcomes for persons with diabetes. A non - pharmacologic intervention in individuals with type 2 diabetes could possibly improve measures of better glycemic control and stress reduction. To live with diabetes we need 1.Diet modifications, 2.Exercise, 3.Medications, 4. Self monitoring of blood sugar and 5.Education and counselling. The bottom line in making change is to believe that, even though change may seem difficult, the result -"a healthier you" now and in the future -is definitely worth it.

CONCLUSION

The Interventions in this study was able to improve glycaemic control and reduction in stress for patients at Sanjoe Hospital. There was significant statistical difference on the dependent variables after the interventions. Counselling interventions can alleviate the living of diabetic patients. Diabetes management first starts with, learning more about diabetes. Non - pharmacologic interventions in individuals with type 2 diabetes could possibly improve measures of better glycaemic control and stress reduction.

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Acknowledgements

The author appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author declared no conflict of interests.

How to cite this article: Rekha K S & U Narayanan (2019). effectiveness of counselling intervention on stress reduction and managing glycaemic level among patients with type 2 diabetes: pre-post intervention. *International Journal of Indian Psychology*, *7*(4), 166-185. DIP:18.01.018/20190704, DOI:10.25215/0704.018