LITERATURE REVIEW

A review of literature relevant to the study is undertaken by the researcher to develop deeper insight into the problem and gain the information on what has been done in past.

A literature review provides readers with a background for understanding current knowledge on a topic and illuminates the significance of new study. Review of literature is an essential step in the development of a research project. It involves the systemic identification, location scrutinizing and summary of written materials that contains information on the research project. Literature reviewed for this study is presented under the following headings.

1] Studies related prevalence of diabetes mellitus.

2] Studies related to problems faced by diabetes mellitus patients.

3] Studies related components of integrated care service and its importance.

4] Studies related to effectiveness of integrated diabetes care program on general well-being of diabetes mellitus patients.

STUDIES RELATED PREVALENCE OF DIABETES MELLITUS

1] Wild S et al (2004) in their article “Global Prevalence of Diabetes estimates for the year 2000 and projections for 2030” they revealed that the prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The urban population in developing countries is projected to double between 2000 and 2030. The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people >65 years of age.

2] Zeleznik D (2007) in his study “Self-care of the home-dwelling elderly people living in Slovenia” revealed that prevalence of diabetes is rising all over the world due to population growth, aging, urbanization, increase of obesity and physical inactivity. An older persons are most affected by diabetes in Asian countries is disproportionately high in young to middle-aged
adults. This could have long-lasting adverse effects on a nation’s health and economy, especially for developing countries.

3] Mohan V et al (2007) in their article “Epidemiology of type 2 diabetes: Indian scenario” revealed that India leads the world with largest number of diabetic subjects earning the dubious distinction of being termed the "diabetes capital of the world". According to the Diabetes Atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in India currently around 40.9 million is expected to rise to 69.9 million by 2025 unless urgent preventive steps are taken. Early identification of at-risk individuals using simple screening tools like the Indian Diabetes Risk Score (IDRS) and appropriate lifestyle intervention would greatly help in preventing or postponing the onset of diabetes and thus reducing the burden on the community and the nation as a whole.

4] Robert AA (2009) reported in IDF Diabetes Atlas that roughly 80% of the people with diabetes are in developing countries, of which India and China share the largest contribution. It is estimated that the total number of people with diabetes in 2010 to be around 50.8 million in India, rising to 87.0 million by 2030. The majority of people with diabetes in developing countries are in the 45 to 64 year age range. In contrast to this the majority of people with diabetes in developed countries are more than 64 years of age and it is estimated that by 2030, this number will rise more than 48 million in developed countries.

5] Gupta V (2009) in his study “Type 2 Diabetes mellitus in India” revealed that The prevalence rate of Diabetes mellitus in urban cities of India, such as New Delhi consists of 10.3% in the year of 2001, Bengaluru is 12.4%, Chennai is 13.5%, and the prevalence of diabetes in Rural India such as Delhi consists of 1.5% in the year of 1991, Mysore is 3.8% in the year of 2005, Vellore is 2.1% in the year of 2007. By compare the rural areas and urban cities of diabetic rates in India shows, the high prevalence rate of Diabetes mellitus in urban cities of India

6] Tripathy PJ et al (2012) explained Diabetes in India, United Over 30 million have now been diagnosed with diabetes in India. The CPR (Crude prevalence rate) in the urban areas of India is thought to be 9 percent. In rural areas, the prevalence is approximately 3 percent of the total population. The estimate of the actual number of diabetes in India is around 40 million. The
total population in India is 1.25 billion in that 40 million people are diabetics, so this means India actually has the highest number of diabetics while compare to the developing countries.

7] Kaveeshwar SA and Cornwall J (2014) in their article “The current state of Diabetes mellitus in India”. conducted by the Indian Council of Medical research (ICMR) revealed that a lower proportion of the population is affected in states of Northern India (Chandigarh 0.12 million, Jharkhand 0.96 million) as compared to Maharashtra (9.2 million) and Tamil Nadu (4.8 million). The National Urban Survey conducted across the metropolitan cities of India reported similar trend: 11.7 per cent in Kolkata (Eastern India), 6.1 per cent in Kashmir Valley (Northern India), 11.6 per cent in New Delhi (Northern India), and 9.3 per cent in West India (Mumbai) compared with (13.5 per cent in Chennai (South India), 16.6 per cent in Hyderabad (south India), and 12.4 per cent Bangalore (South India). Further studies are required in India to highlight cultural and ethnic trends and provide a more complete understanding of the differences in diabetes etiology between Indian and other ethnic groups within India.

8] Kutty V R et al (2018) in their article “Shifting pattern of diabetes among the elderly in India: Evidence from the national sample survey organization's data, 2004–2014” the study revealed that prevalence of self-reported diabetes has increased more among elderly males than among elderly females during 2004–2014. The increase in prevalence percentage is more among young old than the rest. There is a clear-cut rural–urban differential in the burden of diabetes in India. The eastern and southern regions of India marked a higher prevalence as well as increase in diabetes prevalence than the rest of the nation.

9] Chandrakumar et al (2016) in their article titled, “prevalence of hypoglycemia among diabetic old age home residents in South India”. The medication record based observational study was conducted in 9 old-age care facilities across south India from February to September 2015. The cognitive and functional statuses were analyzed and the prevalence of hypoglycemia estimated. The study concludes that most guidelines call for an individualized therapeutic approach suing less aggressive strategies for patients vulnerable to hypoglycemia and geriatric population form such a substantial group. The study highlights the necessity for special attention when considering therapeutic regimen among geriatric patients.
10] Rajadhyaksha V (2018) in his article “Managing diabetes patients in India: Is the future more bitter or less sweet” revealed there is a need to develop good real-world evidence studies to address specific issues in India including association of complications and overall disease control, effectiveness of therapeutic options, role of herbal medicines (which are often consumed by patients) and the role of nurse educators should not be undervalued. The study also showed that high-quality diabetes nurse educator support leads to more independence and adherence to therapies.

STUDIES RELATED TO PROBLEMS FACED BY DIABETES MELLITUS PATIENTS.

11] Edward S (2008) in his article “challenges in the management of type 2 diabetes in elderly” revealed that treating type 2 diabetes in elderly patients presents unique challenges. In all people with type 2 diabetes, many patients still remain inadequately treated because existing therapies have a number of shortcomings, including safety and tolerability issues. These issues are even more profound in the elderly cohort. The ideal management regimens for geriatric patients with diabetes require a multidisciplinary approach that must take into account comorbid-existing medical or psychiatric disorders and the potential for treatment-related complications, as well as the greater risk for hypoglycemia in older patients.

12] Dube A et al (2011) in their study “A Study of Elderly Living in Old Age Home and Within Family”. Explained that India ranks 4th in terms of absolute size of elderly population. The country is not adequately equipped to look after their special health needs and the changing traditional value system. A feeling is now growing among the aged persons that the attitude of the younger generation towards them is not as desired. The traditional sense of duty and obligation of the younger generation towards their older generation is being eroded. The older generation is caught between the decline in traditional values on one hand and the absence of adequate social security system on the other.

13] Clark M (2014) in his article “Adherence to treatment in patients with type 2 diabetes” studied and reported that non-adherence to medication is potentially one of the most serious problems facing diabetes care delivery, particularly in type 2 diabetes. This article, the first of three, looks at the many psychosocial factors that affect how people with diabetes manage their condition, and possible reasons for low adherence, such as rational but mistaken beliefs about the
medication. Health psychology models and possible strategies to improve adherence are discussed in relation to diabetes. The need for more research into behavioural aspects of diabetes management in order to tackle adherence is also acknowledged.

14] **Surani S et al. (2015)** in their article “Effect of Diabetes mellitus on sleep quality” explained that Diabetes mellitus (DM) is a highly prevalent condition affecting about 347 million people worldwide. In addition to its numerous clinical implications, DM also exerts a negative effect on patient’s sleep quality. Impaired sleep quality disrupts the adequate glycemic control regarded as corner stone in DM management and also lead to many deleterious effects causing a profound impact on health related quality of life. DM is one of the most common diseases worldwide. DM, in addition to causing direct sleep disturbances as a result of nocturia, polyuria, diabetic neuropathy and neuropathy pain, has also been associated with several chronic illness as obstructive sleep apnea, cardiovascular complications, hypertension, cerebrovascular accidents and depression which can impair sleep and quality of life.

15] **Coletiva S (2018)** in their article “Factors associated with elderly diabetic adherence to treatment in primary health care” aimed to investigate factors associated with the treatment adherence of 150 elderly diabetics assisted in gerontogeriatric outpatient service in northeastern Brazil. Full adherence to therapy was self-reported by 27.3% of the elderly. In the bivariate analysis, adherence was associated with self-perceived health, beliefs in the use of medication, understanding explanations about diabetes and professional responsible for treatment guidance. After analysis adjustment, only beliefs in medicine were significant when comparing non-adherence with full adherence (OR = 9.65; CI95% 1.6; 56.6) and non-adherence with partial adherence (OR = 18.15; CI95% 3.5;95.4). It can be concluded that full adherence to diabetes treatment is low and is associated with beliefs in medications for disease control. It is necessary to develop additional studies to better define the role of health beliefs and practices of care among elderly assisted in primary health care.

16] **Munsh M (2018)** in his study “Treatment of type 2 Diabetes mellitus in the older patient” concludes that older patients with diabetes should receive individualized counseling regarding lifestyle modification, including a medical nutrition evaluation and exercise counseling. The nutrition prescription is tailored for older people with diabetes based upon medical, lifestyle, and
personal factors. Exercise is beneficial to help maintain physical function, reduce cardiac risk, and improve body composition and insulin sensitivity in older patients with diabetes.

**STUDIES RELATED COMPONENTS OF INTEGRATED CARE SERVICE AND ITS IMPORTANCE.**

17] **Small R and Hopper HJ (1998)** in their study “Evaluation of videotape teaching of self-monitoring of blood glucose by elderly diabetic patients” revealed that The increase in knowledge does not necessarily affect treatment-relevant behavior or glycaemic control and does not necessarily result in a reduction of diabetes-related complications. While diabetes-specific knowledge is necessary for successful self-treatment, it is not sufficient. Therefore, educational programs that primarily impart knowledge about the illness and its treatment should no longer be the sole component of diabetes education.

18] **Anderson RJ et al (2001)** in their study “The prevalence of comorbid depression in adults with diabetes” concludes that Diabetes-related negative emotions and other problems of coping behavior frequently arise over the course of the illness and can negatively influence glycaemic control and patients’ compliance. Patients with diabetes-related complications and/or mental disorders have many difficulties in coping with the illness. A number of various individual and group therapy interventions are available to improve patients coping behavior, especially with regard to diabetes-associated psychosocial and medical problems. However, the majority of studies that have evaluated these types of interventions independent of educational programs could not verify a significant effect on glycaemic control or HRQoL.

19] **Petrak F et al (2005)** Current Diabetes Reviews” Psychosocial Factors and Diabetes mellitus: Evidence-based Treatment Guidelines” The aim of this project was to develop evidence-based guidelines regarding psychosocial aspects of Diabetes mellitus in an effort to help the clinician bridge the gap between research and practice. A patient education program without adequate medical treatment of the diabetes is not successful. The patient education program represents an integral part of the therapy of patients with diabetes and, therefore, must proceed in close coordination with the diabetes treatment.
20] **Johnson J (2005)** in his study “Diabetes Care. Generalizability and persistence of a multifaceted intervention for improving quality of care for rural patients with Type 2 diabetes” concludes that supportive educative system helps the diabetic clients in decision-making, behavior-control and knowledge acquisition. The education system can guide, teach and promote an environment for the diabetic clients to practice the preventive measures like diet control, exercises, medication and foot care and regular follow up.

21] **Elbert S et al (2007)** in their article “Patient Perceptions of Quality of Life With Diabetes-Related Complications and Treatments” conducted A cross sectional study to assess how individuals weigh the quality of life associated with complications and treatments is important in assessing the economic value of diabetes care and may provide insight into treatment adherence.. The study concluded that End-stage complications have the greatest perceived burden on quality of life; however, comprehensive diabetes treatments also have significant negative quality-of-life effects. Acknowledging these effects of diabetes care will be important for future economic evaluations of novel drug combination therapies and innovations in drug delivery.

22] **Padgett D et al (2008)** in their study Meta-analysis of the effects of educational and psychosocial interventions on management of Diabetes mellitus revealed that A patient education program without adequate medical treatment of the diabetes is not successful. The patient education program represents an integral part of the therapy of patients with diabetes and, therefore, it must proceed in close coordination with the diabetes treatment Effectiveness and efficiency (cost-benefit analysis) of educational and treatment strategies must be secured empirically.

23] **Losso JN et al (2009)** in their article Fenugreek bread: a treatment for Diabetes mellitus. Studied Total 8 participants were selected who were on diet control. They were served two slices (56 g) and 5% fenugreek. Blood glucose and insulin were tested periodically over a 4-hour period after consumption. Persons who consumed the fenugreek bread, their blood glucose level got decreased. Conclusion of this study is that fenugreek seed has a medicinal effect for lowering blood glucose level in type 2 diabetes patients,
24] Jyotsna et al (2012) in their study “Comprehensive yogic breathing program improves quality of life in patients with diabetes”. Conducted to assess the effect of a comprehensive yogic breathing program on glycemic control and quality of life (QOL) in patients with diabetes. The study concludes that there was significant improvement in physical, psychological and social domains and total QOL post-intervention in the group practicing the comprehensive yogic breathing program as compared with the group following standard treatment alone.

25] Jain V et al (2014) in their study “Health-Related Quality of Life (Hr-Qol) in Patients with Type 2 Diabetes mellitus”. A descriptive study was conducted to examine the health-related quality of life of diabetic patients in India. The study concluded that the finding of this study will help in health promotion in medical practice in India. It would beckon the much awaited avenue of holistic care of a diabetic patient with equal importance to the mental wellbeing and quality of life, as compared to physical well being.

26] Derakhshanpouri F et al (2015) in their study “Depression and Quality of Life in Patients With Type 2 Diabetes” cross sectional was conducted to investigate the relation between depression and quality of life in patients with diabetes. The mean and standard deviation of quality of life in diabetic patients with and without depression was 50.7 ± 14 and 60.5 ± 13.3, respectively that was significant in two groups (P < 0.0001). The study concluded that the prevalence of depression is high in patients with diabetes and has a considerable impact on the consequences of diabetes and quality of life too.

STUDIES RELATED TO EFFECTIVENESS OF INTEGRATED DIABETES CARE PROGRAM ON GENERAL WELL-BEING OF DIABETES MELLITUS PATIENTS.

27] Kaur KJ et al (1998) studies the assessment of knowledge in self care practices of diabetes and reported that the self care is the important component of Diabetes Control Program. A cross sectional survey was carried out among 15,000 population specifically 60 diabetes in the age group of 20 and above were identified as diabetes. Their knowledge and practice regarding diet, personal hygiene, care of foot wound complication and medications were assessed by using semi structured interview schedule. None of the patients on insulin knew about self therapy
knowledge regarding diabetes complications was partial. There is a need to reorient and motivate personnel in educating diabetes about self care.

**28] Norris SL et al (2001)** in their study “Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials” revealed that, there are a number of unanswered questions concerning the most effective and efficient forms of patient education, methods and didactics, specific target groups, and different measurements of success. Despite sufficient evidence pointing to the effectiveness and efficiency of educational and treatment programs, deficiencies in patient education are common, especially among patients with type 2 diabetes. Only a minority of patients undergo a structured educational program shortly after the diagnosis is made. There are still a large number of patients who have never been trained in managing their diabetes.

**29] Dale B and Soderhamn U (2009)** in their study on “Economic and Health Survey on India’s oldest old (80+)-Needs, Care and Access”. They report that the details of the quantitative study done by Helpage India across 8 cities with a sample size of 833. The findings of this report indicate that the main concern of the oldest of the old is regarding health facilities/services. The senior citizens could benefit greatly by the outreach services. The seniors are not financially independent; so treatment should be provided free of cost or at very nominal charges. Efforts should be taken to sensitize the people towards the needs and concerns of the senior citizens.

**30] Makwana P (2013)** In his article “Knowledge, Attitude and Practice Regarding Diabetes mellitus in Diabetic and Non Diabetic Population”. The study was towards Diabetes mellitus, different knowledge domain and, to evaluate diabetic patients’ awareness towards anti-diabetic therapy, hypoglycemia management and their practical approach towards Diabetes mellitus control. The conclusion of the study was that, there is definite need to empower patients with knowledge required to help them obtain maximum benefit from their treatment for diabetes.

**31] Shende V et al (2013)** in their study “Effect of pranayama on blood glucose level in medical students” study was conducted to assess the effects of pranayama on blood glucose level in medical students. The study concluded that Observations of the present study suggest that short term interventions like pranayama helps in reducing blood glucose level.
32] Ahamadi A et al (2015) in their article “Verifying the effectiveness of CBT on reducing the depression of diabetic patients of type two reported that Diabetes can cause physical and psychological effects and depression is considered to be, one of the symptoms. They have studied 20 patients with diabetes type two from sanandaj City, and were selected by access sampling method and divided in to the two groups, test group (10 persons) and control group (10 persons). Used instrument in this study was Beck depression questionnaire (second version). Experimental group faced 10 sessions of 60 minutes each to an independent variable (cognitive behavioural therapy the achieved results, showed that cognitive behavioural therapy can be effective in reducing symptoms of depression in patients with type 2 diabetes.

33] Gaddam A et al (2015) in their Role of Fenugreek in the prevention of type 2 Diabetes mellitus in diabetes concluded that Dietary supplementation of 10 g Fenugreek/day in prediabetes subjects was associated with lower conversion to diabetes with no adverse effects and beneficial possibly due to its decreased insulin resistance.

34] Herrera VR et al (2015) in their study “Adherence to Two Methods of Education and Metabolic Control in Type 2 Diabetics”. A study conducted to evaluate if a better metabolic control is achieved in diabetic patients undergoing a program of intensive interactive care than in those with traditional care and written information. The study conclude that education programs in T2DM contribute to a decrease in HbA1c within six months, but an intensive program is more effective in reducing cholesterol and LDL.

35] Oliveira RA et al (2015) in their study ”Insulin mediated improvement in glycemic control in elderly with type 2 Diabetes mellitus can improve depressive symptoms and does not seem to impair health-related quality of life”. A study was conducted to Evaluate the association of starting insulin therapy depressive symptoms as well with HRQoL of elderly people with T2D. The Study Concluded That Insulin therapy in elderly people with type 2 diabetes can lead to an improvement of depressive symptoms and does not seem to affect negatively HRQoL of the participants.

36] Mondal S et al (2018) in their study “Yoga as a Therapeutic Intervention for the Management of Type 2 Diabetes mellitus” they aimed to investigate the effects of 12 weeks yogic intervention on blood sugar and lipid profile in elder women with Type 2 Diabetes
mellitus (T2DM) and study concludes that It can be said that yogic intervention may have the beneficial effects on blood sugar and lipid profile in elderly women with T2DM.

37] Ballotari P et al (2018) in their article “Effectiveness of integrated care model for type 2 diabetes: A population-based study in Reggio Emilia”. They concluded that in low-risk patients with T2D, the integrated care model involving both GPs and diabetes clinic professionals showed similar mortality and hospitalisation risks as a model with higher use of specialized care, with exclusive patient management by the diabetes clinic. This was a necessary, but not sufficient, condition to prove the effectiveness of the integrated care model. Further research is needed to assess whether this model is is actually lessen the resource-consuming and more acceptable for patients.