**Evidence-Based Nursing Practice**

**Research Question in PICOT Format**

In diabetic patients, what is the effectiveness of exercise and dietary glycemic control in preventing diabetes-associated complications [as compared to the use of anti-hyperglycemic therapy](https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.116.022622)?

Population: diabetic patients

Intervention:  exercise and dietary glycemic control

Comparison:  anti-hyperglycemic therapy

Outcome: prevention of diabetes-associated complications

Time: The lifetime of diabetic patients

According to the Australian Institute of Health Welfare (2018), diabetes is among the primary chronic diseases that have shown a high prevalence rate and adverse complications to the patients. It is due to this concern that the National Strategic Framework for Chronic Conditions presents approaches to ensure that evidence-based practice is implemented into the clinical practice so that patients can receive appropriate and patient-centered care. Thus achieving quality lives with fewer complications (National Strategic Framework for Chronic Conditions, 2017).

**Evaluation of Research**

A study by Thent et al., (2013) reveals that physical exercises are effective in managing diabetes mellitus with fewer complications as compared to the use of anti-hyperglycemic therapy. In this research, exercise training interventions were used as alternatives treatment therapies for diabetes. The study utilized the meta-analysis of the evidence from various studies on the effectiveness of physical exercises in preventing and controlling diabetes mellitus. A randomized controlled trial study design, with the help of a correlational research design approach, was used to examine the various available articles regarding the effectiveness of physical exercises in controlling and preventing diabetes mellitus. Many of the studies focused on aerobic based exercises and results showed beneficial effects in the prevention of type 2 diabetes mellitus (T2DM) complications as compared to the use of anti-hyperglycemic control which revealed the possibility of drug failure.

The research found out that resistance exercises proved to be more beneficial to the T2DM patients. Also, aerobic exercise had a positive impact towards T2DM as compared to the use of anti-hyperglycemic therapy. Other types of exercises like yoga and endurance exercises were also included in the diabetes management programs. As a result of this research, many parts of the globe have begun to embrace exercise and dietary management towards the control of T2DM. Physical exercises are effective in the prevention and control of diabetes due to their ability to decrease the blood sugar levels in the diabetes patients (Thent et al., 2013).

**Research Topic**

Based on the National Strategic Frameworks for Chronic diseases, chronic diseases have increasingly become a common cause of death in the Australian nation. This is because of a change in lifestyle. This increasing occurrence of chronic diseases with the associated effects as are affecting individuals, families, public health and the nation at large. As such, the National Strategic Frameworks for Chronic diseases provides approaches that outline the management and care principles for the prevention and control of many conditions such as cancer and diabetes. These approaches are evidence-based practices that need to be implemented in the nursing practice to improve the patients’ outcome and the general service delivery of the healthcare sector. That will entail enhanced healthcare management under which chronic patients receive supervised, patient-centered and appropriate services (National Strategic Framework for Chronic Conditions, 2017). The National Strategic Frameworks for chronic disease ensure that the evidence-based practice will result in reduced complications and multi-morbidities.

Research further indicates that the use of modern medical treatments and therapies in the prevention and management of diabetes mellitus cause various complications. Simple physical exercise along with dietary glycemic control can be used to manage diabetes mellitus with fewer complications. Despite that there is lack of interest to participate in physical exercises, the activities are effects in the prevention of type 2 diabetes. For instance, aerobic exercises have been found to increase the oxygen consumption which in turn increases the functioning of the cardiovascular and respiratory organ systems (Thent et al., 2013). Furthermore, physical exercises and dietary glycemic control are natural approaches.

 Physical exercises have shown beneficial impacts on physiological factors as well as in the reduction of the risk factors that are associated with insulin resistance diabetes mellitus. On the other hand, anti-hyperglycemic control therapies have proved to increases the progression of hyperglycemia and insulin resistance (Balk et al., 2015). Therefore, dietary control and physical exercises can be important in the management of diabetes mellitus with fewer complications as compared to the use of anti-hyperglycemic therapy.

**Literature Review**

The National Strategic Frameworks for Chronic conditions provides that evidence-based practices which are appropriate in the nursing practice will ensure patient safety and enhanced outcomes. In this case, improved outcomes for chronic conditions will include slowing the condition’s progression, practices that help to control and delay any other additional chronic disease (National Strategic Framework for Chronic Conditions, 2017). It further provides that an appropriate practice will prevent the complications and disabilities associated with the disease thus enhancing the general wellbeing and the quality of life as it has been provided in the various literature reviews regarding the use of physical exercises to control and prevent diabetes-associated complications rather than using anti-hyperglycemic therapy.

 CardioSmart (2012) reveals that moderate physical activities maintain the normalcy of the blood pressure among diabetic patients. High-volume aerobic exercises result in weight loss which in turn improves the sensitivity to insulin. Physical exercises have different intensities in the prevention and control of diabetes mellitus. Aerobic exercises could comprise of cycling, swimming, treadmill, walking and rope jump. The researchers also say that the aerobic exercises enhance some physiological factors of the body such as glycemic regulation, fasting the blood sugar level as well as well as the lipid profile. Additionally, the restoration of the body endothelial roles and the reduction of the arterial stiffness improves with physical exercises (Thent et al., 2013).

On the contrary, anti-hyperglycemic therapies are associated with some form of side effects and complications. Despite that their actions and effects are felt faster or within a short time of application, their associated side effects are noticeable. The side effects include gastrointestinal effects such as bloating, discomfort in the abdominal parts, diarrhea as well as flatulence (Carpio & Fonseca, 2014). Other long-term complications of anti-hyperglycemic medication including progression of the diabetes mellitus condition as well as increased development of insulin resistance.

  Mendham et al., (2015) show that physical exercises result in glucose regulation and decreases insulin resistance among T2DM. Such exercises include resistance exercises which include weightlifting. High to moderate of these exercises have shown beneficial effects in the prevention of diabetes-associated complications though not as effective as aerobic exercise. This research also highlights the beneficial impacts of aerobic exercises in therapeutic programs of diabetes mellitus patients. As a result, the study recommends physical exercise programs to be implemented for diabetic patients. Similarly, a study by Alhadramy (2016) shows that physical activities such as aerobic and resistance exercises are essential treatment techniques in the management and care of diabetics patients. Physical exercises have proved to be efficient in the treatment of elderly insulin resistance as compared to the use of an-hyperglycemic drugs. As such, resistance exercises have shown to improve insulin sensitivity, enhances the daily energy expenditure as well as improve the quality of life for diabetic patients (Alhadramy, 2016). Additionally, physical exercises especially the resistance training programs improve muscle strength, lean muscle mass, and the density of the bone mineral which in turn improves glycemic control, thus helps in preventing sarcopenia and osteoporosis.

In addition, Laaksonen et al., (2005) indicate that endurance-related exercises have shown to decrease the postprandial hyperglycemia in T2DM. Also, other types of exercises that are not common like yoga as well as Joba have been recommended to be included in the physical exercises training programs for the diabetic patients. This is because yoga classes have positive effects on control the blood sugar levels in the diabetic patients thus improving their quality of life. Balk et al., (2015) revealed that exercises are among the evidence-based practice (EBP) that have proved to be less associated with complications that are related to diabetic conditions. However, the research fails to provide statistical findings of this significance over the results. But randomized controlled trials have proved joba riding exercises to be effective in enhancing the insulin sensitivity among diabetic patients. This article further reveals that exercises and dietary glycemic control have positive roles in the maintenance of the glycemic levels, enhancing insulin sensitivity as well as decreasing cardiovascular-related complications of diabetes (Balk et al., 2015). Thus the findings illustrate that physical exercises resulted in the regulation of blood sugar among diabetic patients. Therefore, physical exercises are effective in the prevention and control of diabetes-associated complications with fewer complications as compared to the use of anti-hyperglycemic therapies.

**The Impact of the Evidence on Future Nursing Practice and Health Outcomes of Patients**

The application of evidence-based practices in the hospital systems for diabetic patients will improve patients’ outcomes. Research shows that the use of physical exercises and dietary control has fewer complications as compared to the use of medicine-based therapies (Carpio & Fonseca, 2014). Future nursing practice should involve the application of such evidence and recommendations into practice for the care of diabetic patients. Therefore, future nurses will focus more on exercise and dietary glycemic control rather than anti-hyperglycemic therapies for positive patient outcomes.

**Recommendations**

Research shows that physical exercises and dietary glycemic control are effective in the control of diabetes with fewer complications as compared to the use of anti-hyperglycemic therapy. However, for future research, I would recommend that further studies be carried out to determine the levels of physical exercises that are beneficial as current literature reveal some form of contradiction. Previous studies indicate that vigorous and high volume exercises are required for effective glycemic control among diabetic patients. However, some other literature hold that only gentle physical exercises are required for effective management of diabetes as high volume exercises have been associated with cardiac problems (National Strategic Framework for Chronic Conditions, 2018). Therefore, it is prudent for further research to done in order to quantify the intensity of physical exercises appropriate to control the glycemic levels among diabetic patients. A qualitative approach will be appropriate for such kind of study since it will take into account the existing literature. In this case, it would apply content analysis method to analyze, compare and contrast the existing evidence to establish new evidence in this study area. Additionally, a qualitative research method applies to such kind of study because it does not tend to generalize findings to a wider population.

**References**

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Thent, Z. C., Das, S., & Henry, L. J. (2013). Role of Exercise in the Management of Diabetes Mellitus: the Global Scenario. *PLoS ONE*, *8*(11). https://doi.org/10.1371/journal.pone.0080436

**Annotated bibliography**

Alhadramy, M. (2016). Diabetes and oral therapies: A review of oral therapies for diabetes mellitus. *Journal of Taibah University Medical Sciences*, *11*(4), 317–329. https://doi.org/10.1016/j.jtumed.2016.02.001

This journal articles provided the side effects of using the medical treatments to manage and control diabetes. These medications included oral therapies and other modern medicines and therapies.

  Carpio, G. R. A., & Fonseca, V. A. (2014). Update on Safety Issues Related to Ant-hyperglycemic Therapy. *Diabetes Spectrum : A Publication of the American Diabetes Association*, *27*(2), 92–100. https://doi.org/10.2337/diaspect.27.2.92

This article provides the safety issues that are associated with the use of anti-hyperglycemic therapy to prevent and manage diabetes. It further provides the side effects that are brought about by the use of anti-hyperglycemic therapy and related therapies in the control and prevention of diabetes.

Thent, Z. C., Das, S., & Henry, L. J. (2013). Role of Exercise in the Management of Diabetes Mellitus: the Global Scenario. *PLoS ONE*, *8*(11). https://doi.org/10.1371/journal.pone.0080436

This article explains the importance of using physical exercises in the management and care of diabetes. In this case, the article elaborates the significance of physical activities in regulating the blood surge level and maintaining it at its normal levels