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ASSESSMENT OF EXERCISE BARRIERS IN TYPE 2 DIABETES PATIENTS: A CROSS SECTIONAL STUDY PERFORMED AT GOVERNMENT DISTRICT HEAD QUARTERS HOSPITAL, UDHAGAMANDAM, THE NILGIRIS, TAMIL NADU, INDIA

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ABSTRACT

The purpose of this study is to assess and rank gender wise barriers associated towards exercise among type 2 diabetes patients. A cross-sectional study was conducted from March 2012 to August 2012 in Government District Head quarters hospital – A secondary care hospital, Udhagamandalam, Nilgiris District, Tamil Nadu State, India. Patients were analyzed for barriers towards regular exercise. Data were obtained through questionnaire and personal interview. Motivational factors among regular exercisers were assessed. The results were analyzed using GraphPad Prism Version 6.02.This study was performed in 150 type 2 diabetes mellitus patients. The results of this study showed that the internal factors such as lack of interest, lack of time, tiredness, body pain, lack of awareness about the importance of regular exercise in controlling diabetes, age, fear of hypoglycaemia and external factors such as family commitment, lack of social support and bad weather contribute to exercise barriers. Also the factors like habituation and feel of comfort contribute to regular exercise. The regular exercise behaviour of most people with Type 2 Diabetes Mellitus patients in the Nilgiris district, Tamil Nadu State, India do not comply with guidelines. It is better late than never to start suitable individual diabetes management care plan to those subjects with an individual exercise regimen considering gender wise barriers.

KEYWORDS: **Type 2 diabetes mellitus, Exercise Barrier, Gender, Tamil Nadu**

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INTRODUCTION

Diabetes is a widespread metabolic disorder and the management of diabetes requires a multidisciplinary approach in which regular exercise (RE) is a key element. Exercise is the corner stone in the prevention and treatment of type 2 diabetes mellitus (T2DM)[1-3], because obesity associated with sedentary lifestyle can contribute to the development of glucose intolerance in certain individuals who are genetically predisposed. Regular exercise improves blood glucose control and can prevent or delay T2DM related complications[4,5]. Further RE promotes reduced cardiovascular events by lowering cholesterol levels, controls blood pressure, reduces the requirement for oral antidiabetic drug dose and insulin dose, enhances insulin sensitivity, reduces stress through antioxidant activity, improves psychological well-being and thereby improves health related quality of life of the patients[1-4]. Various previous prospective cohort and cross-sectional observational studies that assessed exercise through questionnaires showed that RE affects the above said parameters positively, regardless of activity involved[6]. It has been estimated that regular exercise may involve in reducing the risk of coronary heart disease in diabetes by 35%-55%. The diabetes mellitus (types I and II) is accompanied by higher levels of free radicals and decreased antioxidant capacity, leading to oxidative stress on cellular components[7]. Emerging evidence suggests that exercise plays a vital role in preventing this oxidative stress.

The American Heart Association (AHA) and the American Diabetes Association (ADA) recommend at least 2 hours and 30 minutes of moderate-intensive aerobic exercise or at least 1 hour and 30 minutes of vigorous aerobic activity distributed three days per week, with no more than 2 consecutive days of inactivity per week. For patients contraindicated with physical activity the new guidelines recommend 30 minutes of moderate-intensive physical activity at least for 5 days/week, particularly those with type 2 diabetes[1]. Despite the clear evidence that RE plays a major role in management plan of type 2 diabetes, the adherence to RE recommendation in the type 2 diabetes patients in the Nilgiris is not known. Exercise can be defined as a planned, structured and repeated physical activity in order to improve or maintain one or more elements of physical fitness. To the best of our knowledge, there are no other studies assessing RE adherence and barriers towards exercise among T2DM in the Nilgiris district, Tamil Nadu State, India.

METHODOLOGY

A cross-sectional study was conducted from March 2012 to August 2012 in Government District Head quarters Hospital – A secondary care hospital, Udhagamandalam, Nilgiris District, Tamil Nadu State, India. In the present study 150 Type 2 DM patients were analysed for 30 minutes regular exercise 3 to 5 times per week. Data were obtained through questionnaire and personal interview. The results were analyzed using GraphPad Prism Version 6.02. The study was approved by Institutional Review Board, JSS College of Pharmacy, Udhagamandalam, Tamil Nadu, India and informed consent form were taken before the study commencement.

RESULTS AND DISCUSSION

A sample of 150 patients (mean age 37.5 ± 5.0 SD) was interviewed, among the study patients 49.33% (74) were females. The sample group had a literacy level of 23.33% (Table 1). The reported level of regular exercise among T2DM is very less (20 %) and walking was the most commonly followed regular exercise. These results are consistent with studies performed in other parts of the world. The important finding from this study is that the barrier for RE differs among gender. The ranking for RE barriers gender wise is given in table 2 and figure 1 – 3.

Table 1
Demographic data and clinical characteristics of the subjects (n = 150)

Variable	n	Percent
Gender		
Male	76	50.67
Female	74	49.33
Level of Education		
Illiterate	115	76.67
Completed Primary School	23	11.76
Completed Secondary School	10	06.67
Graduated	02	01.33
Age Group		
40 or less	36	24.01
41 – 49	38	25.33
50 – 59	44	29.33
60 or above	32	21.33
Currently smoking (yes)	62	41.33
Diabetes Duration		
1 – 5 Years	36	24.00
5 – 10 years	77	51.33
> 10 Years	37	24.67
Blood Pressure, Uncontrolled (>130/80 mmHg)	79	52.67
LDL Cholesterol, High (>2.5mmol/L)	65	43.33
HDL Cholesterol, Low (<1mmol/L)	23	15.33
Triglycerides, High (>1.7 mmol/L)	68	45.33
Regular Exercise Met (30 minutes 3- 5 times per week)	30	20.00

Table 2
Ranking of the most common barriers to Regular Exercise in participants categorized by gender (n =120)

	Regular Exercise		
Barrier Ranking	**Male (n=70)**	**Female (n =50)**	**T2DM (Both Male and female seen together) (n = 120)**
1	Lack of Time	Family Commitment	Lack of Time
2	Lack of Interest	Lack of Social Support	Lack of Interest
3	Unawareness of exercise importance	Lack of time	Unawareness of exercise importance
4	Tiredness	Age	Tiredness
5	Body Pain	Unawareness of exercise importance	Body Pain
6	Bad Weather	Tiredness	Bad Weather
7	Hypoglycemic Episodes	Body Pain	Hypoglycemic Episodes
8	Family Commitment	Bad Weather	Family Commitment
9	Age	Lack of Interest	Age
10	Lack of Social Support	Hypoglycemic Episodes	Lack of Social Support

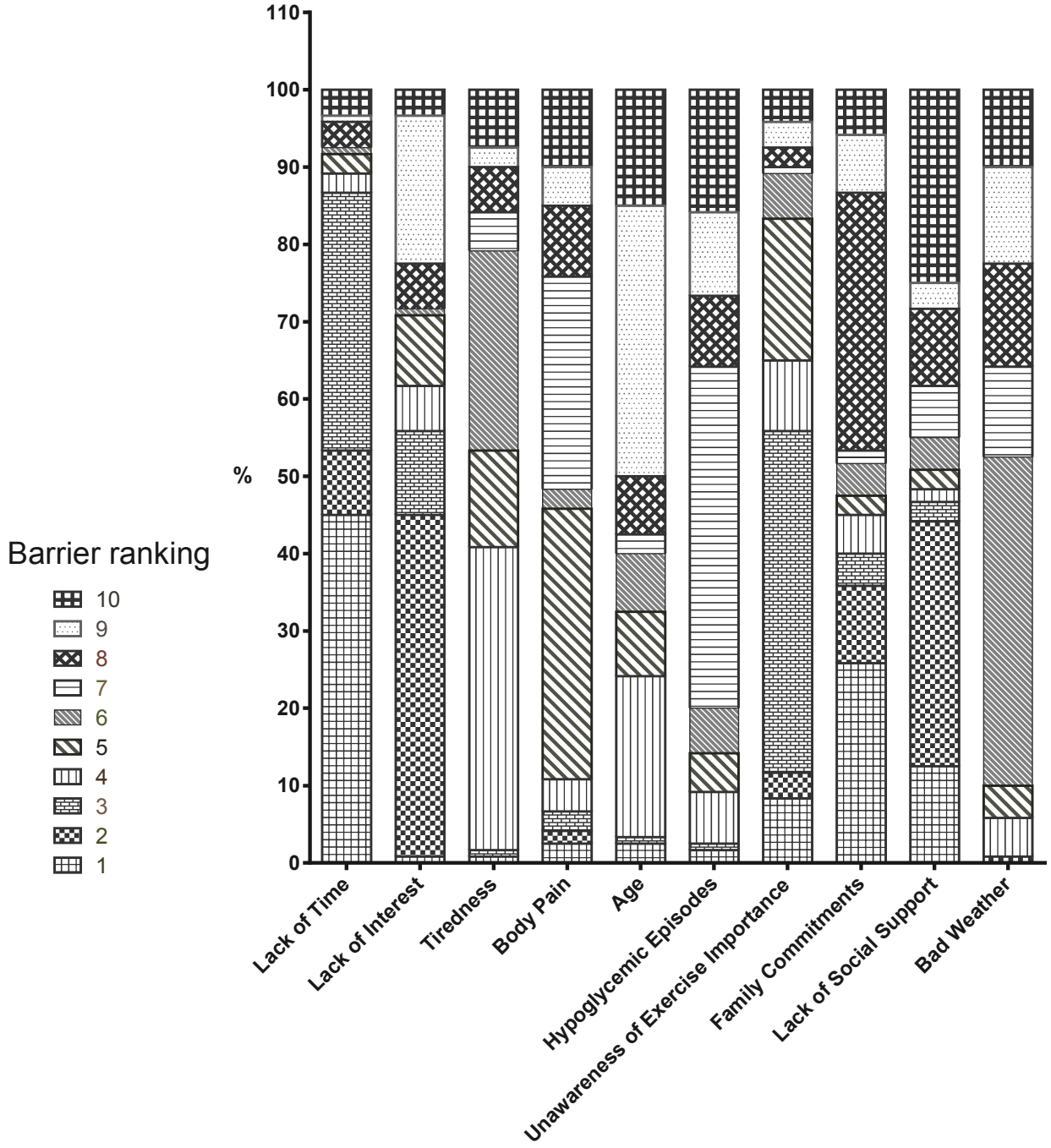

Figure 1
Exercise Barrier in T2DM

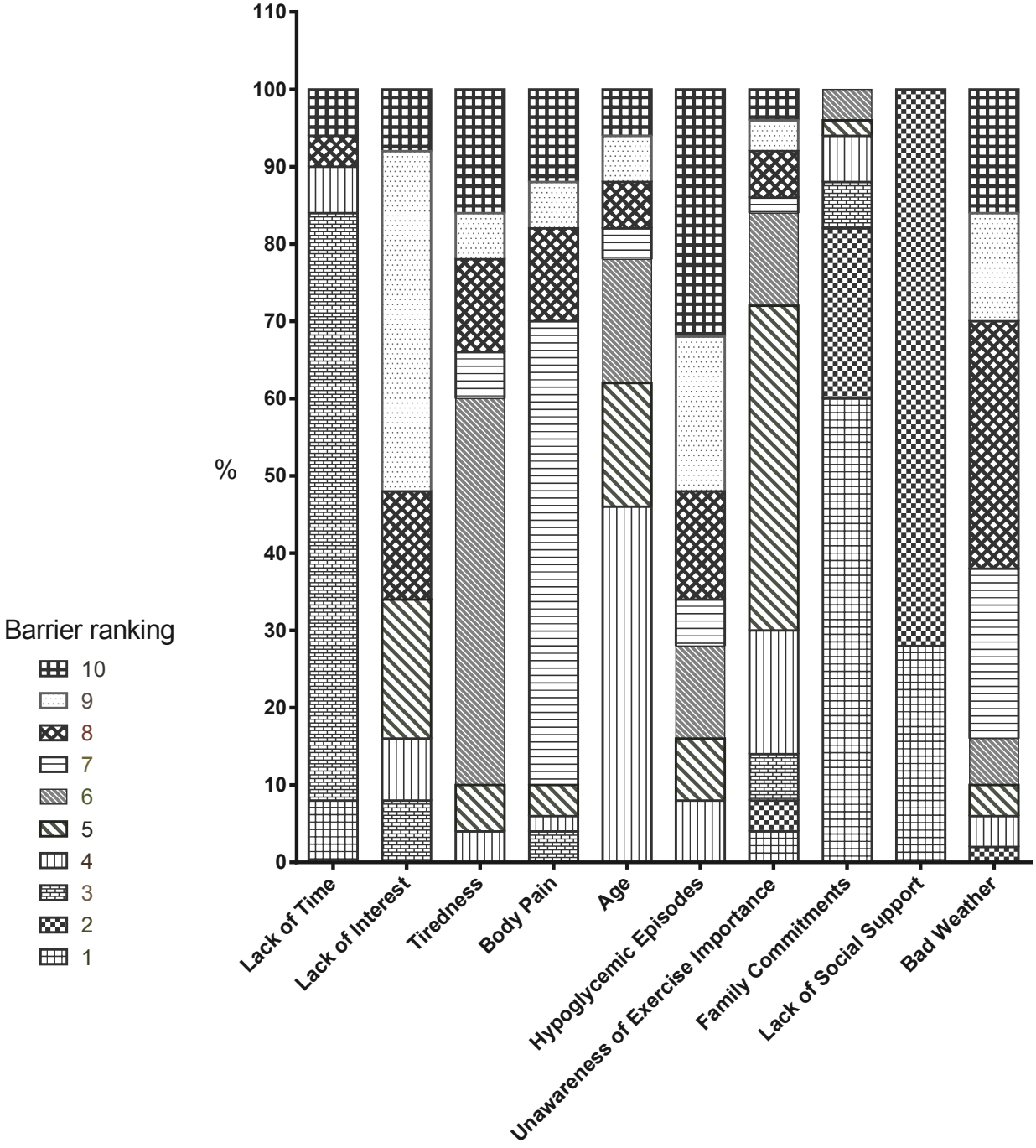

Figure 2
Exercise Barrier in women

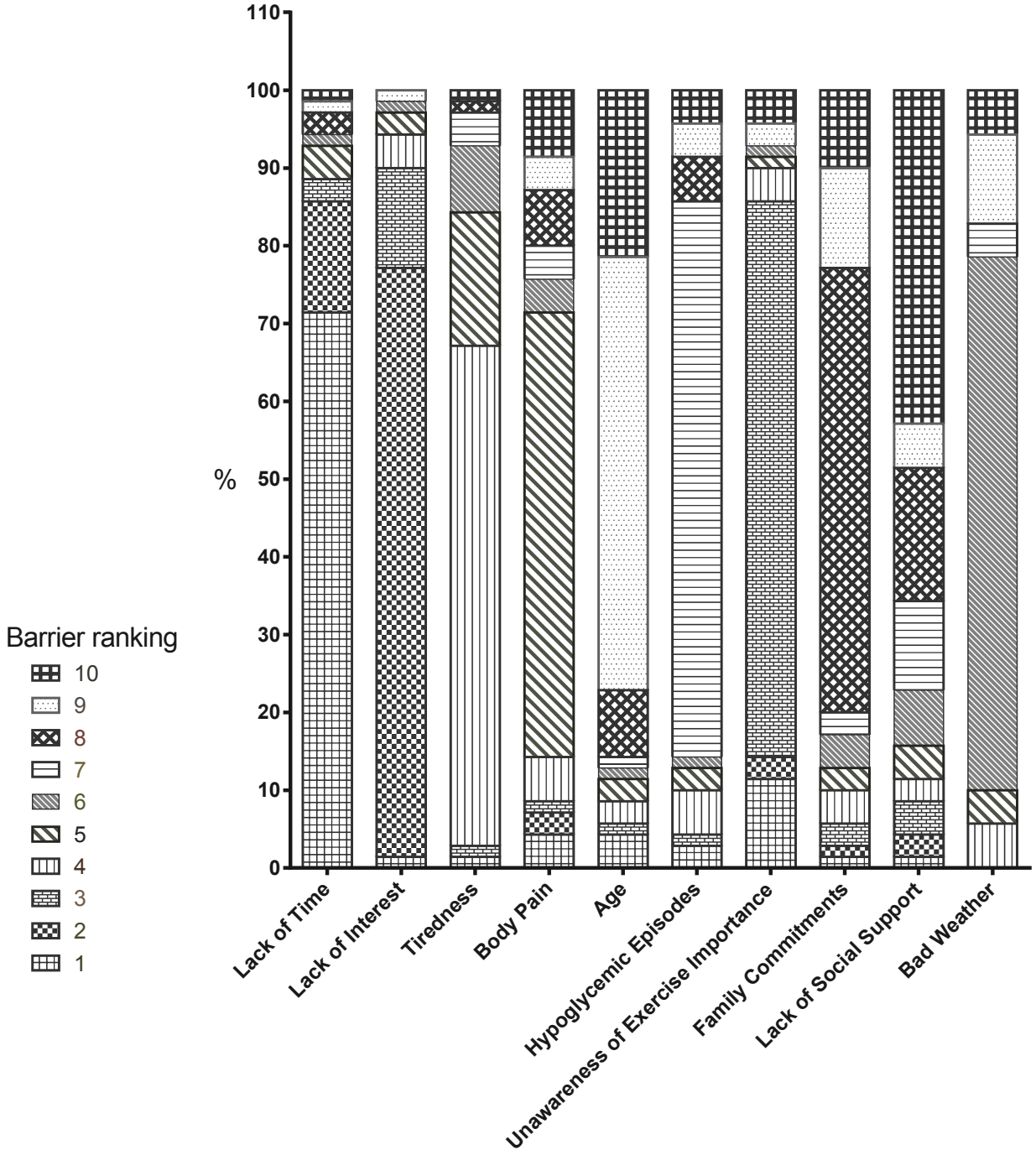

Figure 3
Exercise Barrier in men

The non vigorous (mild to moderate) RE is needed for T2DM patients as a part of diabetes management. Although there are evidences to prove that regular exercise can delay or prevent the diabetes associated complications, the habit of regular exercise in T2DM among Nilgiris population is in question. Hence the present study was carried over to find out the level of RE among T2DM. Among 150 study participants only 30 patients (20 %) have the habit of doing regular exercise. The main reasons for their regular exercise pattern are habituation and feel of comfort. Walking was one of the most commonly followed RE among

them. Analyzing the barriers for not performing regular exercise, two major categories like internal factors and external factors were determined. Internal factors are lack of time, lack of interest, Tiredness, Body Pain, unawareness of RE importance, age, Hypoglycemic Episodes and external factors like family commitment, lack of social support and bad weather were identified. Udhagamandalam is a hill station in the Western Ghats, Tamil Nadu, India and most of the year the place is cool and rainy. Hence it is worthy to include weather as one of the barrier. The important finding in this study is the barriers are not common among male and female. The barriers are ranked from one to ten. The top three barriers for women are family commitment, lack of social support and lack of time; similarly the top three important barriers for men are lack of time, lack of interest and unawareness of RE importance, respectively. Surprisingly age was not among first five barriers in male and T2DM (both male and female). One of the reason this could be possible, as in higher age the lesser the family commitment and higher the awareness about RE. The barriers tiredness and body pain occupied 4th and 5th ranks among men, 6th and 7th ranks among women and 4th and 5th ranks when seen together (both male and female) respectively. This is in direct correlation with not performing RE as in case the RE followers have a feeling of comfort. The study revealed that the levels of physical activity are low in the Nilgiris diabetic population, with only 20% of subjects (30 patients) meeting the recommended minimum guidelines. In this study outdoor walking was the most commonly reported regular exercise, and this is consistent with previous reports. Educational status was not significantly correlated with regular exercise or glycemic control. Although this study was conducted in Udhagamandalam, the hill station the weather was not reported to be among top five barriers to RE. Similarly the availability of RE sources such as tread mill, elliptical machines do not contribute significantly to regular exercise. In this study 4 subjects have atleast one of these exercise machines at home however they fall under non regular exercisers and among them the top three barriers are lack of time, lack of interest and tiredness respectively. Finding out gender wise barriers to exercise are important in the self-management of T2DM[8-11] because by identifying the barriers, health care provider can find solutions to them and focus better on resolving the barriers through motivation[12].

Our study had some limitations. Firstly, RE assessment was based on self-reporting, and not on the measurement of physical fitness such as maximal oxygen consumption (VO_2). Secondly this is a cross-sectional study, which makes it difficult to draw conclusions about entire T2DM. However the information collected from this study is vital which will be useful for framing gender wise strategies for T2DM management plan.

CONCLUSION

Many studies recommend only a general management plan for T2DM whereas this study reports while recommending exercise strategies, gender should be considered and strategy plans framed accordingly. Nevertheless, the RE behaviour of most people with T2DM in the Nilgiris district, Tamil Nadu State, India does not comply with guidelines. It is better late than never to start motivation to those subjects with an individual exercise regimen considering gender wise barriers. In conclusion, RE practices of type 2 diabetic patients in the study site are inadequate[13-16]. Several internal and external barriers gender wise to RE were ranked. Therefore, strategies aiming at overcoming these barriers and improving motivators are urgently needed.

REFERENCES

1. Zinman B, Ruderman N, Campaigne BN, Devlin JT and Schneider SH. Physical Activity/Exercise and Diabetes Mellitus, Position Statement. Diabetes Care, 26(1): S73 -77, (2003).

2. Thomas H. Marwick, Matthew D. Hordern, Todd Miller, Deborah A. Chyun, Alain G. Bertoni, Roger S. Blumenthal, George Philippides and Albert Rocchini. Exercise Training for Type 2 Diabetes Mellitus:

Impact on Cardiovascular Risk: A Scientific Statement from the American Heart Association. Circulation, 119: 3244-3262, (2009).
3. Thomas D, Elliott EJ and Naughton GA. Exercise for type 2 diabetes mellitus. Cochrane Database of Syst Rev, Issue 3: (2006).
4. Aakko Tuomilehto, Jaana Lindström, Johan G. Eriksson, Timo T. Valle, Helena Hamalainen, Pirjo Ilanne-Parikka, Sirkka Keinanen-Kiukaanniemi, Mauri Laakso, Anne Louheranta, Merja Rastas et.al. Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance. N Engl J Med, 344: 1343-1350, (2001).
5. Shan hu Qiu, Zi-lin Sun, Xue Cai, Lili Liu and Bingquan Yang. Improving Patients' Adherence to Physical Activity in Diabetes Mellitus: A Review. Diabetes Metab J, 36:1-5, (2012).
6. Eveliina EK, Maija AA and Jaana HL. Barriers to regular exercise among adults at high risk or diagnosed with type 2 diabetes: a systematic review. Health Promot Int, 24(4): 416 -427, (2009).
7. Siti MSG and Mohd BB. Pilot study on barriers influencing the compliance towards exercise recommendation in patients with diabetes mellitus. Int. J. of Pharm. & Life Sci, 2(10):1107-1114, (2011).
8. Glasgow RE, Hampson SE, Stryker LA and Ruggiero L. Personal-model beliefs and social-environmental barriers related to diabetes self management. Diabetes Care, 20:556-561, (1997).
9. Cox RH, Carpenter JP, Bruce FA, Poole KP and Gaylord CK. Characteristics of low-income African-American and Caucasian adults that are important in self-management of type 2 diabetes. J Commun Health, 29:155-170, (2004).
10. Koch J. The role of exercise in the African-American woman with type 2 diabetes mellitus: applications of the health belief model. J Am Acad Nurse Prac, 14:126-129, (2002).
11. Hays LM and Clarke DO. Correlates of physical activity in a sample of older adults with type 2 diabetes. Diabetes Care, 22:706-712, (1999).
12. Casey D, De Civita M and Dasgupta K. Education and Psychological Aspects Understanding physical activity facilitators and barriers during and following a supervised exercise programme in Type 2 diabetes: a qualitative study. Diabetic Med, 27:79-84, (2010).
13. Funnell MM. The Diabetes Attitudes, Wishes, and Needs (DAWN) Study. Clin Diabetes, 24(4):154-155, (2006).
14. Ambigapathy R, Ambigapathy S and Ling HM. A Knowledge, Attitude And Practice (Kap) Study of Diabetes Mellitus among Patients Attending Klinik Kesihatan Seri Manjung. NCD Malaysia, 2(2):6-16, (2003).
15. Kamiya A, Ohsawa I, Fujii T, Nagai M, Yamanouchi K, Oshida Y and Sato Y. A clinical survey on the compliance of exercise therapy for diabetic outpatients. Diabetes Res Clin Pr, 27:141-145, (1995).
16. Duff EM, Connor AO, McFarlane NA, Wint YB, Bailey EY and Wright RA. Self-Care, Compliance and Glycemic Control in Jamaican Adults with Diabetes Mellitus, West Indian Med J, 55(4):232-236, (2006).