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## Physical exercise and factors affecting among adult diabetic patients at Wolaita Soddo University teaching referral hospital, Southern Ethiopia

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### Abstract

**Background:** Physical activity is an important factor in reducing morbidity from diabetes and maintaining quality of life. Regular physical activity may help to increase the glucose uptake and improve insulin sensitivity in muscle, thus leading to good glycemic control. Even though its positive impact on diabetic patients is scientifically proven, there is lack of research findings on the topic in the country especially in Wolaita zone. Therefore, this study aimed to assess physical Exercise and factors affecting among adult Diabetic patients at Wolaita Soddo University Teaching Referral Hospital.

A facility based cross-sectional study design was used and data was collected from 201 adult diabetic patients by using structured questionnaire for patient interview to collect information on socio-demographic, socio-economic and the patient's knowledge, practice and attitude towards physical exercise.

Among 201 patients participated in the study, 118(58.7%) were males and majority of the respondents found with in age range of 45-54, 78(38.8%) followed by 55-64, 51(27%). Majority, 142 (70.6%) of diabetic patients had a body mass index of above a normal value indicating that they had obesity. Furthermore, 166 (82.6%) of the respondents had positive attitude towards importance of physical exercise for their health but only 18.4% were practicing regular physical exercise for which absence of clear instruction or education given, 21(24.5%) followed by being busy by other tasks accounting 16(22%) were found to be common barriers affecting physical exercise.

In conclusion this study found that level of practicing regular physical exercise among adult diabetic patients at Wolaita Soddo University teaching referral hospital was found to be insufficient and majority of the diabetic patients were obese. Hence there should be regular follow up of patients' body mass index and regular exercise education should be given during their each hospital visit.

**Keywords:** Physical exercise, Soddo, Diabetes, Practice, Attitude

### Introduction

Appropriate management targeting weight reduction, glycemic control, hypertension, and lipid management is important for reducing morbidity and mortality, and improving long-term quality of life for patients diagnosed with type 2 diabetes mellitus (T2DM). Particularly, in patients with type 2 diabetes, diet and physical activity are essential first line therapies, and many clinical practice guidelines now recommend initiating metformin at diagnosis <sup>[1]</sup>.

Physical activity is an important factor in reducing morbidity from DM and maintaining quality of life. Regular physical activity may help to increase the glucose uptake and improve insulin sensitivity in muscle, thus leading to good glycemic control. Furthermore, vigorous and moderate physical activity such as brisk walking reduces the risk of developing type 2 DM. Prospective studies with adequate follow-up, showed a strong association between exercise and reduced rates of death from any cause, particularly diabetes <sup>[2, 3]</sup>.

Regular physical activity is a key part of diabetes self-management. Studies show that the risk of mortality among people with diabetes is inversely related to fitness level. The new guidelines of the American Diabetes Association and American College of Sports Medicine *Exercise and Type 2 Diabetes Recommendations (2010)* states that it is now well-established that physical activity improves blood glucose control and can prevent or delay Type 2 diabetes mellitus, along with positively affecting lipids, blood pressure, cardiovascular events, mortality, and quality of life by reducing symptoms of depression <sup>[4]</sup>

Little is known about the physical activity level of DM patients in Ethiopia. Thus, this study will be performed to assess the knowledge, attitude and practice regarding physical activity among individuals with DM at WSUTRH, Southern Ethiopia. Hence, this study will try to assess the knowledge,

attitude and level of practice regarding physical exercise and factors affecting it among diabetic patients as this plays an important role in improving treatment of diabetic patients and reducing cardiovascular risks among them.

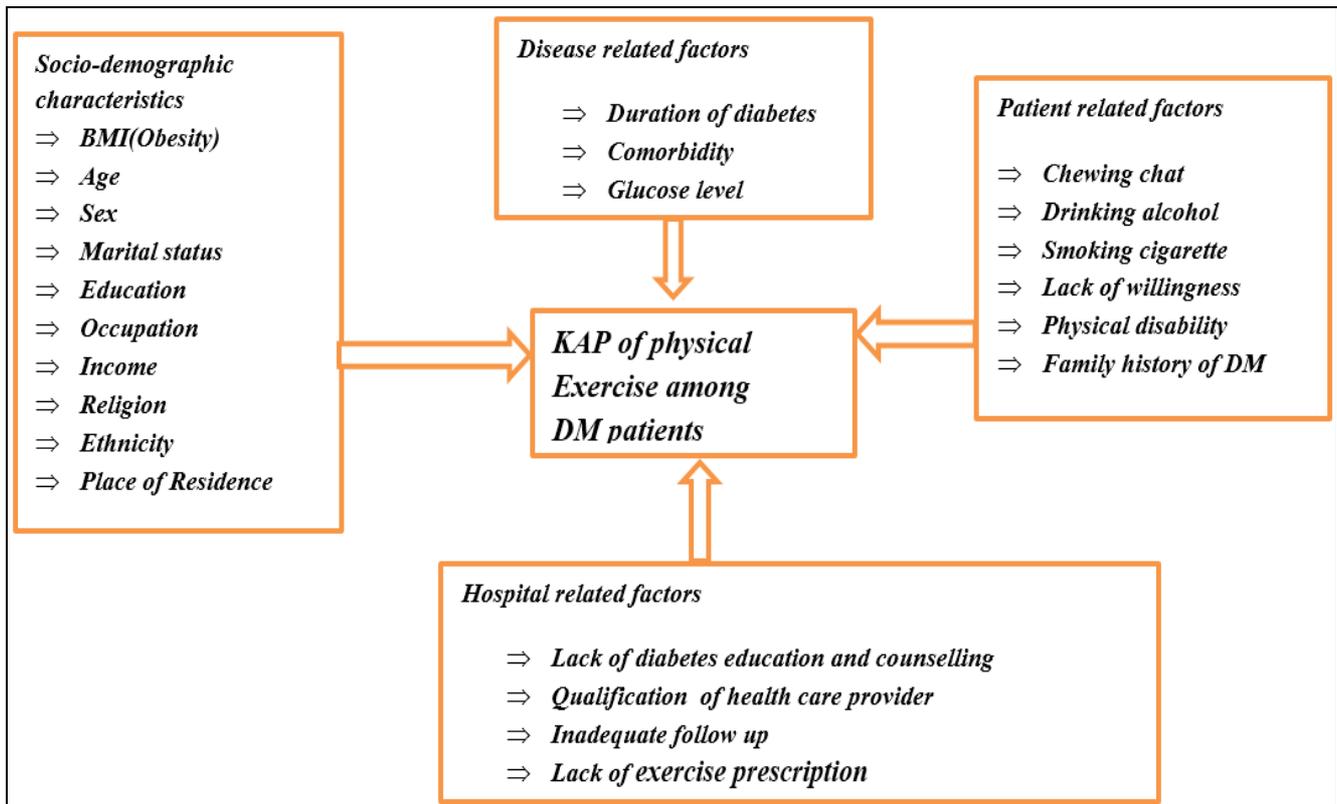


Fig 1: Conceptual frame work of the study

**Methodology**

**Study setting and period**

The study was carried out among patients with type 2 diabetic patients at Wolaita Soddo University Teaching hospital. The Hospital is located 380 km away from the national capital Addis Ababa and 170 km far from the regional capital Hawassa. The teaching hospital was established in 1923 and serving people in catchment area of above 2 million. It is one of the two teaching referral hospitals in the region and it has the total capacity of about 195 inpatient beds. The hospital provides its service to about 1836, 1452 patients per year [5]. Currently there are about 410 type 2 diabetic patients on their chronic care. The study was conducted from February to April, 2017.

**Study design:** Institutional based retrospective cross-sectional study was conducted.

**Study participants:** The study participants were adult type2 diabetes patients who were attending their follow up care in the hospital during the study period.

**Inclusion criteria:** Type 2 diabetes patients who have been on chronic care follow up.

**Exclusion criteria:** Unwilling patients, age <18 years, critically ill, those with documented psychiatric problems and with gestational diabetes were excluded from the study.

**Source population:** All diabetic patients who visit WSUTRH for their chronic care.

**Sample Size Determination and Sampling technique:** The prevalence of practicing physical exercise was 31.1% taken according to study conducted in Harari [6] and Z value of 1.96 at 95% confidence interval was used and 10% was added for non-response rate. The sample size was determined by using single population proportion and correction formulas. Formula for Correction for finite population was considered since the source population is below 10,000.

$$no = \frac{z^2 pq}{e^2} = 329,$$

Where; no = is the sample size (the desired sample size when target population is greater than 10,000), e = is the desired level of precision/margin of error (0.05), p= is the estimated proportion of physical activity (p=31.1%), and q is 1-p.

**Corrected sample size;**  $n = \frac{no}{1+no/N} = 182.77 \approx 183$ , finally 10% was added for non-responses,  $n = 183 + 18.3 = 201$ , Where; N is size of finite population (type2 diabetics) = 410

**Data collection procedures:** Data was collected through structured questionnaire which was translated to the local language for patient interview to collect information on socio-demographic, socio-economic and information on KAP of physical exercise.

**Source of data:** The data for this study was obtained from adult diabetic patients themselves. Data like socio-

demographic, economic characteristics, family history, knowledge, attitude, practice and barriers for physical exercise was obtained by using direct interview of the patients.

**Data collecting tools/instruments:** this study utilized different instrument or tools for data collection such as: structured questionnaire, pens, pencils, erasers, note pads, flip charts and markers, scientific calculators and computer were uses for data analysis.

**Methods of data analysis:** completeness of the data was checked every day and cleaned and analysed. Descriptive analysis was computed as frequency, mean and standard deviation (SD) for continuous variables and for categorical data. The out puts of different study findings was presented using tables, graphs, & figures accordingly.

**Ethical consideration:** Formal letter was obtained from department of Sport Sciences and given to the hospital. There was also a written consent taken so that the patients agreed to give his/her medical information. Patients were assured that lack of willingness to involve in the study could not affect the service they get from the hospital. To ensure patient confidentiality, name and address of the patient was recorded in the data collection format. The patients were clearly informed that his/her medical information would not be disclosed to any external subjects/media.

#### Operational definitions and terms:

Aerobic exercise is continuous exercise such as walking; bicycling or jogging that elevates breathing and heart rate. Resistance exercise involves brief repetitive exercises with weights, weight machines, resistance bands or one's own body weight to build muscle strength.

**Obese persons:** Those whose body mass index (BMI) is greater than 25kg/m<sup>2</sup>.

**Barriers for physical exercise:** perceived reasons reported by respondents for which they do not practice physical exercise.

**Regular physical exercise:** doing physical exercise in fixed or scheduled days and duration per weeks.

**Physically active:** those patients reported that they are doing regular physical exercise.

#### Results

Among 201 patients participated in the study, 118(58.7%) were males and it was also found that most of study participants were married 136(67.6%), protestant religion followers 92(45.7%), with Wolaita ethnicity predominance which is 120(60%). Additionally, majority of diabetic patients attended Secondary school, 70(34.8%), were merchants, 87(43.3%), those with monthly income of 1000-2000 ETB, 69(34.3%) and urban dwellers, 178 (88.6%). Most importantly, this study found that majority 142 (70.6%) of diabetic patients had a body mass index of above a normal value indicating that they had obesity which necessitates doing physical exercise a major concern in this population [Table 1].

**Table 1:** Socio demographic characteristics of study participants

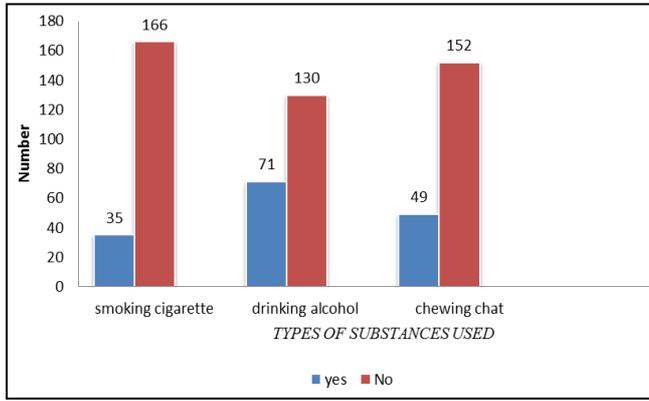
Variables	Number (frequency)	Percentage (%)
BMI Above 25kg/m <sup>2</sup>	142	70.6
Below 25kg/m <sup>2</sup>	59	29.4
Sex Male	118	58.7
Female	83	41.3
Marital status	136	67.6
Married	22	11
single	14	7
Separated /divorced widowed (er)	32	16
Religion Protestant	92	45.7
Orthodox	68	33.8
Muslim	21	10.
Catholic	12	6.5
Other	8	4
Ethnicity Wolaita	120	60
Gurage	19	9
Gamo	36	18
Gofa	20	10
Others	6	3
Educational status		
Illiterate	29	14.4
Elementary school	55	27.3
Secondary school	70	34.8
Diploma and above	47	23.5
Occupation Merchant	87	43.3
Employee	62	30.8
Farmer	34	17
Others	18	9
Monthly income (birr) Below 500	35	17.4
500-1000	64	31.8
1000-2000	69	34.3
Above 2000	33	16.5
Place of Residence Urban	178	88.6
Rural	23	11.4
Family history of diabetes		
Yes	58	29
No	143	71

As depicted in the table below, majority of the respondents found within age range of 45-54, 78(38.8%) followed by 55-64, 51(27%).

**Table 2:** Age distribution of respondents

Age group (years)	Frequency	Percent
35-44	30	15
45-54	78	38.8
55-64	51	25.3
Above 65	42	21

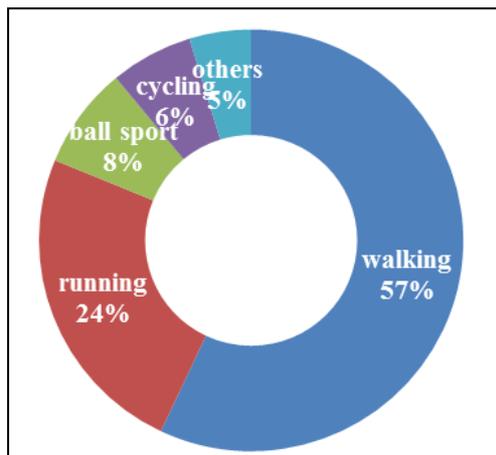
As depicted in the figure below, this study also collected data on substance abuse and found that 35(17.4%) smoke cigarette, 49(23.4%) chew chat but drinking alcohol accounted a greater proportion which was 71(35.3%). [Figure 2]



**Fig 2:** Prevalence of substance abuse among study participants, N=201

Regarding practice of regular physical exercise, the study found that only 37(18.4%) of the respondents reported as they were practising physical exercise regularly but out of total respondents, 73(36.3%) reported that they never engaged in physical exercise.

Furthermore, majority 166 (82.6%) of the respondents had positive attitude towards importance of physical exercise for their health. But 47% of them reported that only those with DM can benefit from doing physical exercise and 35 % perceived that all people can benefit from doing physical exercise. Among those patients doing physical exercise, the most common types used were walking up hills, 73(57%) and running, 31(24%) [Figure 3].



**Fig 3:** Common Types of physical exercises practiced among study participants, N=128

Regarding the knowledge of patients on physical exercise, almost half of them 63(49%) and 42(32.8%) reported as they were doing it for weight reduction and to improve their overall health respectively. The most common reasons for not doing regular physical exercise were absence of clear instruction or education given, 21(24.5%), absence of materials 16(22%) and being busy by other tasks accounting 17.8%.

**Table 2:** Perceived Reasons of diabetic patients for not doing physical exercise, (N=73).

Perceived Reasons	Number	Percentage (%)
I have no clear instruction	21	24.5
Doctor told me not to do	5	6.8
No material	13	17.8
I have no time or busy by other tasks	16	22
I dislike it	8	11
No specific reason	10	13.7

**Table 3:** Information on knowledge, attitude and practice regarding Physical exercise

Physical activity	Frequency	Percentage
Doing regular physical exercise		
Yes	37	18.4
Yes but not regularly	91	45.3
No	73	36.3
Knowledge on reason of doing physical exercise (N=128)		
To spend time	9	7
For recreation purpose	14	11
To reduce weight	63	49.2
To improve my overall health	42	32.8
Who do you think can benefit from doing physical exercise?		
Only those with DM	95	47
All people	70	35
I don't know it	36	18
Do you think that physical exercise is good for your health?		
Agree	166	82.6
Disagree	24	12
Neutral	11	5.4
Importance of PE for diabetic and obese persons (N=201)		
A. Improves blood glucose	33	14.4
B. Reduces body weight	94	46.7
C. Maintains blood pressure	16	8.0
D. Reduces stress	11	5.5
E. Improves glucose and wt	47	23.4

**Discussion**

This study was aimed to assess the knowledge practice and attitude regarding physical exercise among type 2 diabetic patients in WSUTRH. The majority of participants in this study were in the age groups of 44-55 years (38.8%), 56-64 years (25.31%) and above 65 years (21.2%). This reflects the fact that type 2 diabetes mellitus usually has its onset after the age of 40 years. The preponderance of these age groups is also consistent with the findings of a study conducted in Mamelodi District Hospital, South Africa, Pretoria [7]. As per their occupation, majority of the respondents were merchants (43%) and employees (31%) which are sedentary life styles decreasing engagement in physical activity by sitting long time or uncontrolled feeding style both of them are risks for diabetic and obese persons.

The high prevalence of obesity (70.6%) amongst the participants is similar to the findings in 2009 by South African study which found that 71% were obese [7]. Obesity is a major risk factor for type 2 diabetes mellitus and the sedentary lifestyle and lack of physical activity amongst the participants seem to contribute to the high proportion of overweight and obese persons in this study.

Among those patients doing physical exercise, the most common types used were walking up hills, 73(57%) and running, 31(24%). This is similar with a study done in Jordan among Jordanians with Diabetes Mellitus, which found that more than a half of participants reported as the common type exercise they engaged in was walking (51%) followed by running (19%) [8]. This could be reasoned out that these exercises are simple and do not need much cost, and place which makes them more preferable than other types.

This study found that the three common reasons or barriers for not doing physical exercise were absence of clear instruction or education given, 21(24.5%), absence of materials (17.8%) and being busy by other tasks accounting 16(22%) This finding is similar with a study conducted in

Malaysia <sup>[9]</sup> and clearly indicates that there is inadequate diabetes education regarding life style modification especially physical exercise in the hospital.

This is inconsistent with the Jordan's study which found that lack of desire was the commonest reason but it was the least in our study. The reason could be due to difference of study population in age, educational level, living style, and study design itself may contribute to the discrepancy between the two studies.

The larger percentage of respondents reported as they did not have clear instruction regarding physical exercise shows that there is a gap in knowledge of life modification of diabetic persons. Majority, 166 (82.6%) of the respondents had positive attitude towards importance of physical exercise for their health but 12% had negative attitude or they reported as they did not like to do physical exercise.

Regarding substance abuse among the respondents, a total of 155(77%) diabetic patients used either of the three prohibited substances in this population. Among these 71(35%) reported as they drink alcohol, which has significant deleterious effect on blood sugar, circulation and heart as well. 49(24.4%) reported as they chewed chat which could be a major contributing factor for not doing physical exercise and increase in weight as they sit long time and take much fluids along with chat.

In this study, majority of the respondents were rural diabetic patients (88.6%) compared to urban (11.4 %) which is consistent with a study conducted among diabetic patients in India <sup>[10]</sup>. This might probably be due to inactive living styles like sitting for long time watching moves, office works, absence of walking; chewing chat and coffee ceremony in rural areas contribute to high prevalence of DM.

It was also found that majority (71%) of diabetics reported that there was no family history of diabetics. This is also in agreement with the study in India which showed that 72.4% had negative family history of diabetes. This might partially be explained as reduced concern of people to physical activities and lack of knowledge or unwillingness to have health status screening. Theoretically, type 2 diabetes has stronger family association than type 1 diabetes but current study showed that majority of patients had no family history which may be a clue for increasing prevalence of this type of diabetes due to sedentary life style.

The proportion of diabetic patients practicing regular physical exercise was found to be only 18.4% among the respondents. According to many treatment guidelines, life style modification such as physical exercise is a main component of diabetes management for better control of their plasma sugar and other comorbid conditions. But this study found that physical activity among the study participants was poor. This finding is consistent with a study conducted in Malaysia <sup>[9]</sup> which found that physical activity among type diabetics was unsatisfactory and also associated with poor glycaemic control, especially in the elderly.

## Conclusion

This study found that level of practicing regular physical exercise among adult diabetic patients at Wolaita Soddo University teaching referral hospital was found to be insufficient. Lack of exercise education and being busy by other tasks were found to be the most common barriers for low prevalence of physical exercise. Furthermore, this study found that majority of diabetic patients were obese and hence there should be regular follow up of patients' body mass index and regular exercise education should be given during

their hospital visit.

## Recommendation

Based on the findings of the study, the following recommendations were forwarded to the hospital, health care providers, and other concerned bodies.

- The hospital should construct a better care plan incorporating physical exercise as main component of diabetes management.
- All health care providers taking care of diabetics should monitor their body mass index in regular basis.
- Additionally, health care providers should give clear instruction which type, why and when to do physical exercise during each follow up.
- Finally, the hospital should arrange regular diabetes education session with its holistic approach for better management.
- Further research should be conducted to determine predictors of KAP of physical exercise and glycaemic control

## Limitations of the study

This study has been limited by; the chance of recall bias in adherence assessment as it was based on respondents self-report, absence of causality assessment for perceived reasons for not practicing physical excessive and chart review may result in missing of some data.

**Competing interests:** The authors declare that there is no competing interest.

**Authors' contributions:** The authors conceived and designed the study, analysed the data, and drafted the manuscript.

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**Abbreviations:** ADA (American Diabetes Association), IDF (International Diabetes Federation), JUSH (Jimma University Specialized Hospital), MMAS (Morisky Medication Adherence Scale), T2 DM (Type 2 Diabetes Mellitus), WHO (World health organization), WSU (Wolaita Soddo University), WSUTRH (Wolaita Soddo University Teaching Referral Hospital).

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