

ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 11

Number 12

December 2020



Indian Journal of Public Health Research & Development

An International Journal

Website:

www.ijphrd.com

Indian Journal of Public Health Research & Development

EXECUTIVE EDITOR

Vidya Surwade

Associate Professor, Dr Baba Saheb Ambedkar, Medical College & Hospital, Rohinee, Delhi

INTERNATIONAL EDITORIAL ADVISORY BOARD

1. **Dr. Abdul Rashid Khan** B. Md Jagar Din, (*Associate Professor*)
Department of Public Health Medicine, Penang Medical College, Penang, Malaysia
2. **Dr. V Kumar** (*Consulting Physician*)
Mount View Hospital, Las Vegas, USA
3. **Basheer A. Al-Sum**,
Botany and Microbiology Deptt, College of Science, King Saud University,
Riyadh, Saudi Arabia
4. **Dr. Ch Vijay Kumar** (*Associate Professor*)
Public Health and Community Medicine, University of Buraimi, Oman
5. **Dr. VMC Ramaswamy** (*Senior Lecturer*)
Department of Pathology, International Medical University, Bukit Jalil, Kuala Lumpur
6. **Kartavya J. Vyas** (*Clinical Researcher*)
Department of Deployment Health Research,
Naval Health Research Center, San Diego, CA (USA)
7. **Prof. PK Pokharel** (*Community Medicine*)
BP Koirala Institute of Health Sciences, Nepal

NATIONAL SCIENTIFIC COMMITTEE

1. **Dr. Anju D Ade** (Professor)
Community Medicine Department, SVIMS, Sri Padamavati Medical College, Tirupati,
Andhra Pradesh.
2. **Dr. E. Venkata Rao** (*Associate Professor*) Community Medicine,
Institute of Medical Sciences & SUM Hospital, Bhubaneswar, Orissa.
3. **Dr. Amit K. Singh** (*Associate Professor*) Community Medicine,
VCSG Govt. Medical College, Srinagar – Garhwal, Uttarakhand
4. **Dr. R G Viveki** (*Associate Professor*) Community Medicine,
Belgaum Institute of Medical Sciences, Belgaum, Karnataka
5. **Dr. Santosh Kumar Mulage** (*Assistant Professor*)
Anatomy, Raichur Institute of Medical Sciences Raichur(RIMS), Karnataka
6. **Dr. Gouri Ku. Padhy** (*Associate Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
7. **Dr. Ritu Goyal** (*Associate Professor*)
Anaesthesia, Sarswathi Institute of Medical Sciences, Panchsheel Nagar
8. **Dr. Anand Kalaskar** (*Associate Professor*)
Microbiology, Prathima Institute of Medical Sciences, AP
9. **Dr. Md. Amirul Hassan** (*Associate Professor*)
Community Medicine, Government Medical College, Ambedkar Nagar, UP
10. **Dr. N. Girish** (*Associate Professor*) Microbiology, VIMS&RC, Bangalore
11. **Dr. BR Hungund** (*Associate Professor*) Pathology, JNMC, Belgaum.
12. **Dr Sartaj Ahmad**, PhD Medical Sociology, *Associate Professor*,
Swami Vivekananda Subharti University Meerut UP India
13. **Dr Sumeeta Soni** (*Associate Professor*)
Microbiology Department, B.J. Medical College, Ahmedabad, Gujarat, India

NATIONAL EDITORIAL ADVISORY BOARD

1. **Prof. Sushanta Kumar Mishra** (Community Medicine)
GSL Medical College – Rajahmundry, Karnataka
2. **Prof. D.K. Srivastava** (*Medical Biochemistry*)
Jamia Hamdard Medical College, New Delhi
3. **Prof. M Sriharibabu** (*General Medicine*) GSL Medical College, Rajahmundry,
Andhra Pradesh
4. **Prof. Pankaj Datta** (*Principal & Prosthodontist*)
Indraprastha Dental College, Ghaziabad

NATIONAL EDITORIAL ADVISORY BOARD

5. **Prof. Samarendra Mahapatro** (*Pediatrician*)
Hi-Tech Medical College, Bhubaneswar, Orissa
6. **Dr. Abhiruchi Galhotra** (*Additional Professor*) Community and Family
Medicine, All India Institute of Medical Sciences, Raipur
7. **Prof. Deepti Pruthvi** (*Pathologist*) SS Institute of Medical Sciences &
Research Center, Davangere, Karnataka
8. **Prof. G S Meena** (*Director Professor*)
Maulana Azad Medical College, New Delhi
9. **Prof. Pradeep Khanna** (*Community Medicine*)
Post Graduate Institute of Medical Sciences, Rohtak, Haryana
10. **Dr. Sunil Mehra** (*Paediatrician & Executive Director*)
MAMTA Health Institute of Mother & Child, New Delhi
11. **Dr Shailendra Handu**, *Associate Professor*, Phrma, DM (Pharma, PGI
Chandigarh)
12. **Dr. A.C. Dhariwal**: *Directorate* of National Vector Borne Disease
Control Programme, Dte. DGHS, Ministry of Health Services, Govt. of
India, Delhi

Print-ISSN: 0976-0245-**Electronic-ISSN:** 0976-5506, **Frequency:** Quarterly
(Four issues per volume)

Indian Journal of Public Health Research & Development is a double blind peer reviewed international journal. It deals with all aspects of Public Health including Community Medicine, Public Health, Epidemiology, Occupational Health, Environmental Hazards, Clinical Research, and Public Health Laws and covers all medical specialties concerned with research and development for the masses. The journal strongly encourages reports of research carried out within Indian continent and South East Asia.

The journal has been assigned International Standards Serial Number (ISSN) and is indexed with Index Copernicus (Poland). It is also brought to notice that the journal is being covered by many international databases. The journal is covered by EBSCO (USA), Embase, EMCare. The journal is now part of DST, CSIR, and UGC consortia.

Website : www.ijphrd.com

©All right reserved. The views and opinions expressed are of the authors and not of the Indian Journal of Public Health Research & Development. The journal does not guarantee directly or indirectly the quality or efficacy of any product or service featured in the advertisement in the journal, which are purely commercial.

Editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)

Published at

Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall,
Sector- 32, Noida - 201 301 (Uttar Pradesh)



Indian Journal of Public Health Research & Development

www.ijphrd.com

Contents

Volume 11, Number 12

December 2020

1. Trends of Complications of Chronic Otitis Media in Tertiary Care Facility in Western Uttar Pradesh 1
Abhay Kumar Singh, Harsimrat Singh, Waseem Ahmad, Himani Singh, Sachin Agarwal
2. Middle Ear Risk Index [MERI] as Prognostic Factor in Tympanomastoidectomy with Tympanoplasty .6
Abhay Kumar Singh, Harsimrat Singh, Waseem Ahmad, Himani Singh, Sachin Agarwal
3. “Break The Chain” to Embrace New Possibilities in Dental Education..... 11
Anjali Anil, Vidya G.D
4. Comparative Evaluation of the Prevalence of Dental Caries, Apical Periodontitis and Periapical Abscess in a Population of North Lucknow, Uttar Pradesh, India..... 16
Ayush Razdan Singh , Ashok Kumar Srivastava, Bikram Brahmachary
5. Upper Extremity Thrombosis Associated with Overactivity: A Comprehensive review article on Paget-Schroetter Syndrome..... 22
Balaji M S, Darshan Sohi
6. Determinants of Birth Weight of Meitei and Meitei Pangan Communities of Manipur.25
Chirom Pritam Kumar Singh, S. Jibonkumar Singh
7. Trends in Contraceptive Use in Manipur, India: A Review..... 33
Lhingneilhai Kipgen, Ksh Belya Luxmi Devi, Tongbram Rubyrani Devi, S. Jibonkumar Singh
8. COVID -19: Impacts of Quarantine on Mental Health and Stress..... 41
Deep Chand, Taruna Verma, Rituraj Verma, Ashu Taneja, Sanghamitra Jena
9. Psychosocial factors associated with patients with OCD 47
Devika Raje, Vikas Punia, Nandha Kumara Pujam S
10. Knowledge and Practice Related to Menstrual Health and Hygiene in Female Athletes– A Cross-Sectional Study 53
Ditee Jaydeep Desai, Dhruv Dave
11. Health Problems of International Travellers in States of Karnataka and Goa, India- A Cross Sectional Study 59
Kashavva B Andanigoudar, Dattatraya D Bant

II

12. A Cross Sectional Study to Assess Pretravel Health Preparation Among the International Travellers in States of Karnataka and Goa..... 66
Kashavva B Andanigoudar, Dattatraya D Bant
13. Development and Validation of Jegadeesan and Maimoona Impulsivity Parent Rating Scale (Jam-Iprs) for Adhd Children 72
R. Renuchitra, Maimoona Ajmal, T.Jegadeesan
14. Intradialytic Hypertension in Patients Unergoing Hemodialysis in Tertiary Care Hospital..... 78
Rohith Nayak, Ravindra Prabhu Attur, Arya M B
15. Effect of Vestibular Stimulation on Language Skills of Children with Attention Deficit and Hyperactivity Disorder..... 83
T.Jegadeesan, P. Nagalakshmi
16. Effect of Sensory Integration Approach on Children with Dyspraxia..... 88
T.Jegadeesan, P. Nagalakshmi
17. Perception of Students Towards Anatomy Internal Assessment in Competency based Undergraduate Curriculum..... 95
Vaijyanthimala.P, Leonoline Ebenezer J Mahima Sophia M, Sasirekha M. Kamalakannan.S
18. Factors Influencing Attitude and Behaviour Concerning Waste Management in Riverbank Villages of Ganga: A Cross-Sectional Study 99
Goutam Sadhu, Arindam Das
19. Allergic Fungal Rhinosinusitis: A Study in a Tertiary Care Hospital in Malwa region of Punjab 107
Grace Budhiraja , Sumati Goyal, Harsimrat Singh
20. Incidence of Cervical Spondylosis as Cause of Vertigo in a Tertiary Care Hospital in Malwa region of Punjab 112
Grace Budhiraja, Danish Guram , Harsimrat Singh
21. Incidence of BCC in a Tertiary Care Hospital in Malwa region of Punjab 115
Grace Budhiraja, Pulkit Bharti, Harsimrat Singh
22. Evaluate the Association between the Interpterygomaxillary Notch and the Width of Maxillary Anterior Teeth 120
Sowmya S, Akanksha Roy, Raghavendra Swamy K. N
23. Effect of Dynamic Neuromuscular Exercise Training on Explosive Arm Strength and Agility in Basketball Players 127
Tushar Dhawale, Ujwal Yeole, Minal Kargutkar
24. Correlation between Physical Activity Level and Therapeutic Success on Patients with Type 2 Diabetes Mellitus in Dr. Soetomo General Hospital Surabaya..... 134
Adiba Hasna Hanifah, Soebagijo Adi Soelistijo, Bambang Purwanto
25. Esthetic Outcome of Computer-Guided Versus Free-Hand Immediate Implant Placement In Fresh Extraction Sockets in Esthetic Zone, A Randomized Clinical Trial 140
Ahmed Kotb, Maha Elkerdawy, Mahmoud Elfar

26.	Obesity Contribution in Synthesis And Degradation of Cartilage Marker Through Inflammation Pathway in Osteoarthritis Patient: Analysis of Adiponectin, Leptin, Ykl-40 and Cartilage Oligomeric Matrix Proteinase (Comp).....	148
	<i>Synovial Fluid, Faridin HP, Syakib Bakri</i>	
27.	Collective Efficacy and Communication Ability according to Emotional Intelligence in Nursing Students.....	154
	<i>Hye-Yun Jung, Sook Kang</i>	
28.	Knowledge of Pregnant Women Concerning the Physiological Delivery Process in Babylon Governorate	161
	<i>Maryam Abd Al-Kareem, Salma Kadhum, Saadia Hadi</i>	
29.	Extraction violate oil CLAMC and Its Rapid Therapeutic Effect for the Treatment of Chronic Sinusitis, Headaches and Colds	169
	<i>Rawaa J A Matloob, Abeer Mansour Abdelrasool, Mohammed Farhan Ali</i>	
30.	Investigating The Effect of of Pharmacist Educational Intervention on the Proper Use of Insulin Pen in Older Patients with Type 2 Diabetes Mellitus in Primary Health Care and Diabetic Centres in Makkah Al-Mukarramah, Saudi Arabia.....	174
	<i>Yosra Alhindi, Shahd Sharaf, Asayel Almeftahi, Renad Felemban, Enas Hamza, Aziza Aljehani, Sarah Mukhtar</i>	
31.	Causes & Impacts of Flood Disaster in Bangladesh: Special Focus on Public Health.....	181
	<i>Mohammad Nurhamim</i>	
32.	Patient Satisfaction of Computer-Guided Versus Free- Hand Immediate Implant Placement in Esthetic Zone, A Randomized Controlled Trial.....	190
	<i>Safaa K. Hussein, Amr H. Elkhadem, Amal F. Kaddah</i>	
33.	Serum Cortisol, Progesterone and Total Antioxidant Status of Students Pre-and Post-Examination	197
	<i>Joseph C. Awalu, Chinedum C. Onyenekwe, Nkiruka R. Ukibe, Joseph E. Ahaneku,; Sunday E. Ejemete, Tochukwu Udeh, Ezinne G. Ukibe</i>	
34.	Fall Injury and Socio-Demographic Characteristics among House Hold In Ethiopia.....	207
	<i>Hailemichael Mulugeta, Woinshet Bediru , Zemachu Ashuro , Steven M. Thygerson</i>	
35.	Effectiveness of Targeted Health Education with Focus on Knowledge and Practice among Hospital Sanitation Workersdesignated in Isolation Wards as Part of the Pandemic Preparedness for COVID-19	215
	<i>Priyanka R, JubinaBency A T, Joe Thomas, Ronnie Thomas, Unnikrishnan U G, Lucy Raphael</i>	
36.	Depression, Anxiety, and Stress among Medical Students in the Faculty of Medicine Universitas Airlangga Year Batch 2016, 2017, and 2018.....	223
	<i>Tasca Rizkina Maulida, Azimatul Karimah, Pudji Lestari, Maftuchah Rochmanti</i>	
37.	Early bonding, Parenting Styles and Temperament: Association between three-generational Aspect of Parenting.....	231
	<i>Husena Dhariwala, Shwetha T.S</i>	

IV

38. Current Prevalence of Malaria Knowledge and Practices among Residents of a Rural Community in South India 238
Sunil B.N., Naresh Kumar S.J., Prasanna Kamath B.T., Muninarayana C
39. Incident Location Distance and Transportation to Hospital Delayed Arrival Patients Post-Acute Ischemic Stroke Attack in Emergency Department East Java-Indonesia 244
Dewi K. Ningsih, Sri Andarini, Dewi Rachmawati
40. Socio Demographic Profile of Late Childhood and Adolescence Abusing Cannabis 250
Ambika C, Karaline Karunagari D, Sreedevi J
41. Assessment of Oral Health Related Quality of Life in Obsessive Compulsive Disorder Patients in Saudi Arabia 256
Abdulrahman A Al-Atram, Hidayathulla Shaikh, Asiya Fatima, Karthiga Kannan
42. Cervical Proprioception and Dynamic Balance in Computer Users: A Comparison between Male and Female Healthy Adults 263
Pramod Kumar Sahu, PT, Sajjad Alam, Pooja Kukreti, Neha Chauhan, Mangalam Kumari, Nazia Shahid

Correlation between Physical Activity Level and Therapeutic Success on Patients with Type 2 Diabetes Mellitus in Dr. Soetomo General Hospital Surabaya

Adiba Hasna Hanifah¹, Soebagijo Adi Soelistijo², Bambang Purwanto³

¹Bachelor Student, Faculty of Medicine University of Airlangga, Surabaya, Indonesia, ²Head of Internal Medicine Department, Dr. Soetomo General Hospital Surabaya, Indonesia, ³Head of Physiology Department, Faculty of Medicine University of Airlangga, Surabaya, Indonesia

Abstract

Background: Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar levels that occur due to abnormal working/secretion of insulin. Meanwhile, physical activity plays a significant role in regulating blood sugar levels in type 2 diabetes mellitus (T2DM) patients. During physical activity, insulin resistance decreases because when muscles contract, membrane permeability increases, and glucose can enter the cells. **Objectives:** The study aimed to determine the correlation between physical activity level and the therapeutic success of T2DM patients. **Method:** This cross-sectional study sample was all T2DM patients in Dr. Soetomo General Hospital internal polyclinic with a sample size of 87 people taken by consecutive sampling. Data was collected by direct interviews using the IPAQ questionnaire. The study variables were the therapeutic success and physical activity level of T2DM patients. **Results:** At a low level of physical activity, 69.8% of respondents had not met the therapeutic success criteria, at a moderate level, 56.0% have met the criteria, at a high level, 66.7% have not met the criteria. **Conclusion:** There is no correlation between physical activity level and the therapeutic success of T2DM patients at RSUD Dr. Soetomo Surabaya ($p = 0.086$).

Keywords: Cross-sectional Analysis, Diabetes Mellitus, IPAQ, Physical Activity, Therapeutic Success

Introduction

Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar levels (hyperglycemia). This can occur due to abnormal working insulin, abnormalities in insulin secretion, or a combination of both¹. Indonesia is one of the 10 countries with the highest number of diabetic patients at the age of 20-79 years, ranked 6th in 2017. 80% of patients with type 2 diabetes mellitus (T2DM) are in middle or low-income

countries with an age range of 40-59 years². Surabaya is the largest city in East Java and ranked sixth in the case of diabetes mellitus in 2018 with a total of around 4,5 million patients³. This study aims to determine the correlation between physical activity level and the therapeutic success of T2DM patients by looking at the percentage of patients who achieved the criteria for therapeutic success with their level of physical activity.

Material & Methods

This analytical, observational, and cross-sectional study has a population of all patients with T2DM in the internal polyclinic diabetic division who entered Dr. Soetomo General Hospital from August-December 2019. The minimum sample size in this study was 79 people with an added 10% for anticipation so that the study sample was 87 respondents. The study used consecutive sampling as a sampling technique where all subjects

Corresponding Author:

Dr. Soebagijo Adi S,

dr., Sp.PD-KEMD, FINASIM

Address : Department of Internal Medicine Dr.

Soetomo General Hospital. Jl. Mayjen Prof. Dr.

Moestopo No. 6-8, Gubeng, Surabaya, Indonesia 60286

E-mail : soebagijo@yahoo.com

Telephone number : +62(812)3531065

who came and met the selection criteria were included in the study until the required number of subjects were met. The subjects must be a diabetic polyclinic patient in Dr. Soetomo General Hospital, has T2DM, aged between 15-65 years old, complete medical record, not having a high physical activity (builders, construction workers and laborers), not having disabilities that cause immobilization or unable to do physical activity, and not having a cardiorespiratory disease (Stroke, COPD, Cardiac decompensation) which cause a decrease of physical activity intensity or duration.

The variables studied were 2 hours post-prandial blood sugar <180 mg / dL, fasting blood sugar <130 mg / dL (bounded variables), and physical activity level of patients with type 2 diabetes (free variables). Data was collected by having a direct interview using IPAQ-SF (International Physical Activity Questionnaire-Short Form) and seeing patients' laboratory results. The collected data were analyzed through Cramer's V and Chi-Square methods. In statistics, Cramer's V is used to see the correlation between nominal data. Meanwhile, Chi-Square is used to see the correlation between 2 categorical variables

Results & Discussion

Table 1 Gender Distribution

Gender	Frequency	%
Male	40	46
Female	47	54
Total	87	100

Table 2 Age Distribution

Age (years old)	Frequency	%	Mean	Standard Deviation
20-35	4	4,6	53,71	8,589
36-50	22	25,3		
51-65	61	70,1		
Total	87	100		

Table 3 Physical Activity Level and Therapeutic Success

Physical Activity Level	Therapeutic Success		Total	p value
	Not achieved	Achieved		
Low	37 (69,8%)	16 (30,2%)	53 (100,0%)	0,086
Moderate	11 (44,0%)	14 (56,0%)	25 (100,0%)	
High	6 (66,7%)	3 (33,3%)	9 (100,0%)	
Total	54 (62,1%)	33 (37,9%)	87 (100,0%)	

According to table 1, from 87 respondents, there were more female patients than male.

According to table 2, out of 87 respondents, the most age group was in 51-65 years old, and the least was in 20-35 years old.

According to table 3, most patients with low and high physical activity level have not met the therapeutic success criteria, and most patients with moderate physical activity level have met the therapeutic success criteria.

The p-value of Cramer's V and Chi-Square test was 0,086. It can be concluded that H0 is accepted and Ha is rejected ($p > 0,05$). Thus it can be interpreted that there is no correlation between physical activity level and therapeutic success of T2DM patients in Dr. Soetomo General Hospital Surabaya. This also means that the physical activity level of T2DM patients does not determine therapeutic success. Several things might contribute to this result. First, there may be some patients who failed to find the equivalent activities based on the intensity despite the existing examples. Secondly, there may be some patients who miscalculated the duration of their physical activities because this questionnaire only relied on estimation and recalls. Third, there may be some confounding and more dominant factors that can influence the results of the study even though they had been eliminated such as medication adherence, counseling, family supports, knowledge and education, stress level, diet and eating patterns, food selection, and sleep quality.

The Non-Correlation between Physical Activity Level and Therapeutic Success

This study establishes that there is no significant correlation between physical activity level and therapeutic success. This indicates that physical activity level is not directly proportional to the therapeutic success of patients with T2DM. High physical activity level cannot guarantee the therapeutic success of patients with T2DM. This finding is supported by a few studies which suggested that this might be caused by most of the respondents who were elderly patients who were unable to do heavy intensity activities. Besides, many respondents are housewives and related to light activities that can be interspersed with rest. This is consistent with

the theory that when resting for an extended period after doing physical activity, the physical activity undertaken will not have much influence on blood sugar levels. Besides intensity, the duration of activity also influences the therapeutic success in patients with T2DM⁴. It was also stated that there was no acute effect in different intensity of physical activity on post-prandial blood sugar levels in the respondents and no blood sugar decreases either being indoors or outdoors after doing submaximal physical activity⁵. The role of physical activity interventions in controlling blood sugar in T2DM was also considered less significant because, in the groups that had performed physical activity interventions, there were no significant controlled blood sugar results ($p = 0.549$)⁶. People with moderate physical activity had the possibility of controlled blood sugar by 0,367 times compared to people with low physical activity. However, moderate physical activity level category did not have a significant relationship with blood sugar levels ($p = 0,061$)⁷. There may be some confounding and more dominant factors that can influence the results of the study even though they had been eliminated such as medication adherence, counseling, family supports, knowledge and education, stress level, diet and eating patterns, food selection, and sleep quality.

Medication Adherence

There is an association between anti-diabetic medication adherence with the regulation of blood sugar levels in diabetic patients. Respondents who are not compliant in taking anti-diabetic drugs will have 14 times greater risk of experiencing poor blood sugar regulation compared with respondents who are compliant in taking anti-diabetic drugs ($p = 0.015$, OR = 14)⁸. Blood sugar level (controlled) has a significant correlation with the level of adherence to consume high category anti-diabetic drugs ($p = 0.002$). Respondents who consumed high category anti-diabetes drugs were 0.143 times more likely to be compliant in regulating blood sugar levels compared to respondents who consumed low anti-diabetes drugs. If the patient is not compliant in taking anti-diabetic drugs, his blood sugar level will be difficult to control. If the patient is obedient, the opposite will happen. It can be concluded that blood sugar levels are associated with adherence to consuming high category anti-diabetic drugs ($p = 0.002$). In contrast, blood sugar levels are not associated with adherence to consuming

low and moderate category anti-diabetic drugs ($p = 0.066$)⁷. Medication adherence is also related to the number of drugs given⁷. In the linear regression test results found that there is a significant influence between the number of drug items to the adherence score of Morisky Medication Adherence Scale-8 (MMAS-8) in patients with T2DM ($p = 0.012$)⁹. The adherence level influences the therapeutic regimen factor for the amount of drug the patient receives. If the number of drug items increases, the value of adherence scores in patients with T2DM will decrease. According to this, increasing the number of pills ingested in a day can reduce the level of adherence¹⁰.

Many factors affect the non-adherence of taking medication; 4 categories are from the patients (age, education, occupation, partner), disease factors, therapeutic regimen factors, and interaction factors with practitioners²². The adherence level will be lower the more they age. It can be caused due to the physiological decline caused by aging¹⁰. In this study, medication adherence was not scrutinized so that the role of medication adherence could not be excluded from the therapeutic success

Counseling

A decrease in blood glucose levels 2 hours post-prandial after counseling shows that counseling affects the knowledge and attitudes of patients to act adherently to the management of diabetes mellitus which includes diet, exercise, and treatment⁶. In this study, education/knowledge was not scrutinized so that the role of counseling could not be excluded from the therapeutic success.

Family Support

Psychosocial factors (e.g. family support) play an essential role in glycemic control too. A family is a social group that plays a vital role in diabetics behavior because family is an influential factor in fostering patient compliance in undergoing therapy¹¹. In this study, family support was not scrutinized so that the role of family support could not be excluded from the therapeutic success.

Knowledge and Education

Educational material can include maintenance/

care of feet, research and the latest technology about diabetes mellitus, education of special conditions faced (pregnant, fasting/sick days), plans for special activities (sports/achievements), management during suffering from other diseases, and introduction and prevention of complications¹². Improving the knowledge of patients can be done via family. Therefore, to have a controlled blood sugar levels, family involvement in every routine control in health care is necessary because some patients are elderly who had experienced some deterioration of physiological organs such as memory, hearing, and vision¹³. In this study, education/knowledge was not scrutinized so that the role of education/knowledge could not be excluded from the therapeutic success.

Stress Level

Sympathetic nervous system secretion is the first reaction of the stress response then followed by sympathetic-medullary secretion. The hypothalamus-pituitary system will be activated when stress persists. The hypothalamus secretes corticotropin-releasing factor which stimulates the anterior pituitary to produce adrenocorticotrophic hormone (ACTH). Increased blood glucose levels are influenced by the production of cortisol that is stimulated by ACTH¹⁴. Blood sugar levels will be in normal limits if the stress level is within the normal range and vice versa¹⁵. In this study, the stress level was not scrutinized so that the role of stress level could not be excluded from the therapeutic success

Diet Adherence and Eating Patterns

Diabetes mellitus patients need to be stressed about the importance of the type and calorie content in the regular eating schedule, especially in those who undergo insulin therapy or use drugs that increase insulin secretion itself¹². The higher the education, the higher the awareness and knowledge of the importance of diabetes mellitus diet in maintaining blood sugar levels. A good level of education makes the respondent had a good motivation to recover faster from illness¹⁶. Dietary factors give ± 11 times influence on increasing blood glucose levels in patients with T2DM¹⁷. Elderlies who had an eating hobby are 5 times more likely to develop diabetes mellitus compared to older adults who had enough eating habits ($p = 0.001$, OR = 5,067)¹⁸. In this study diet/eating pattern was not scrutinized so that the role of diet/eating pattern could not be excluded from the

therapeutic success.

Food Selection

Salty, fatty, and sweet food diet is significantly related to diabetes mellitus. Consumption of fatty and sweet foods had a lower risk of developing diabetes mellitus. While the consumption of salty foods is at risk for diabetes mellitus by 2.62 times¹⁹. This is different from previous studies that the habit of consuming sweet foods has a doubled risk of developing diabetes mellitus²⁰. In this study, the food selection was not scrutinized so that the role of the food selection pattern could not be excluded from the therapeutic success.

Sleep Quality

Sleep quality can also affect the therapeutic success. Decreased sleep quality is caused by sleep disturbances that cause a decrease in the body's response to insulin, insulin resistance, and abnormal glucose tolerance²¹. In this study sleep quality was not scrutinized so that the role of sleep quality could not be excluded from the therapeutic success

Conclusion & Acknowledgement

Based on this study results, the following conclusions can be drawn:

1. 81 T2DM patients in Dr. Soetomo General Hospital, who were the respondents had a proportion of 46% male and 54% female with the most age group at 51-65 years old (70.1%) with the average age 53.71 years old

2. Low physical activity level is the most undertaken by most respondents (60.9%)

3. Most therapeutic success criteria of the respondents are "not achieved" (62.1%)

4. At the low physical activity level, most respondents have not met the therapeutic success criteria (69.8%), at the moderate physical activity level, most respondents have met the therapeutic success criteria (56.0%), and at the high physical activity level, the most respondents have not met the therapeutic success criteria (66.7%)

5. The most therapeutic success criteria "achieved" are owned by respondents with low physical activity

level (48.5%) and the therapeutic success criteria "not achieved" are most owned by respondents with low physical activity level (68.5%)

6. There is no correlation between physical activity level and therapeutic success on patients with T2DM in Dr. Soetomo General Hospital Surabaya ($p = 0.086$)

Conflict of Interest: There was no conflict of interest in this study

Ethical Clearance: The Ethical Clearance is taken from the health research ethics committee at Dr. Soetomo General Hospital Surabaya, Indonesia.

Source of Funding: This study was supported by the authors

References

1. Purnamasari D. Diagnosis dan Klasifikasi Diabetes Mellitus. In Setiati S, Alwi I, Sudoyo AW, Stiyohadi B, Syam AF (ed). Buku Ajar Ilmu Penyakit Dalam Jilid II Edisi VI: 232-237. Jakarta: Faculty of Medicine University of Indonesia, 2014. Indonesian
2. IDF Diabetes Atlas 8th ed. Brussels: International Diabetes Federation, 2017
3. Hasil Utama RISKESDAS 2018 Provinsi Jawa Timur. Surabaya: Riset Kesehatan Dasar, 2018. Indonesian
4. Azitha M, Aprilia D, Ilhami YR. Hubungan Aktivitas Fisik dengan Kadar Glukosa Darah Puasa pada Pasien Diabetes Mellitus yang Datang ke Poli Klinik Penyakit Dalam Rumah Sakit M. Djamil Padang. *Jurnal Kesehatan Andalas*. 2018; 7(3). Indonesian
5. Purwoto, S. Perbedaan Pengaruh Intensitas Aktivitas Fisik Terhadap Kadar Glukosa Darah Post Prandial (GDPP), Protein Total Dan Interleukin-6 (IL-6) Otot Model Mencit Diabetes [Bachelor thesis]. Surabaya: University of Airlangga; 2019. Indonesian
6. Sucipto A, Rosa EM. Efektivitas Konseling DM dalam Meningkatkan Kepatuhan dan Pengendalian Gula Darah pada Diabetes Mellitus Tipe 2. *Muhammadiyah Journal of Nursing*. 2014; 1(1). Indonesian
7. Widodo C, Tamtomo D, Prabandari AN. Hubungan Aktivitas Fisik dan Kepatuhan Mengonsumsi Obat

- Anti Diabetik dengan Kadar Gula Darah Pasien Diabetes Mellitus di Fasyankes Primer Klaten. JSK. 2016 Dec; 2(2). Indonesian
8. Nanda OD, Wiryanto B, Triyono EA. Hubungan Kepatuhan Minum Obat Anti Diabetik dengan Regulasi Kadar Gula Darah pada Pasien Perempuan Diabetes Mellitus. *Amerta Nutr.* 2018; 2(4):340-348. Indonesian
 9. Ainni, A. 2017. Studi Kepatuhan Penggunaan Obat Pada Pasien Diabetes Mellitus Tipe-2 di Instalasi Rawat Jalan RSUD Dr. Tjitrowardojo Purworejo Tahun 2017 [Bachelor thesis]. Surakarta: University of Muhammadiyah Surakarta; 2017. Indonesian.
 10. Rosyida L, Priyandani Y, Sulistyarini A, Nita Y. Kepatuhan Pasien Pada Penggunaan Obat Antidiabetes Dengan Metode Pill-Count dan MMAS8 di Puskesmas Kedurus Surabaya. *Jurnal Farmasi Komunitas.* 2015; 2(2):39-44. Indonesian
 11. Isworo A. Hubungan Depresi Dan Dukungan Keluarga Terhadap Kadar Gula Darah Pada Pasien Diabetes Mellitus Tipe 2 Di RSUD Sragen. *The Soedirman Journal of Nursing.* 2010 Mar; 5(1). Indonesian
 12. PERKENI. Konsensus Pengelolaan dan Pencegahan Diabetes Mellitus Tipe 2 di Indonesia, Indonesia: Perkumpulan Endokrinologi Indonesia, 2015. Indonesian
 13. Muhibuddin N, Sugiarto S, Wujoso H. Hubungan Pengetahuan dan Sikap Keluarga dengan Terkendalinya Kadar Gula Darah pada Pasien Diabetes Mellitus Tipe 2 (Studi di Rumah Sakit Umum Daerah Kabupaten Kediri). JSK. 2016 Sept; 2(1). Indonesian
 14. Smeltzer SC, Bare BG. *Textbook of Medical Surgical Nursing.* Philadelphia: Lippincott, 2010
 15. Boku A. Faktor-Faktor yang Berhubungan Terhadap Kadar Gula Darah Pada Penderita Diabetes Mellitus Tipe 2 di RS PKU Muhammadiyah Yogyakarta [Bachelor thesis]. Yogyakarta: University of 'Aisyiyah Yogyakarta; 2019. Indonesian
 16. Astuti L. Hubungan Kepatuhan Diet dengan Kadar Gula Darah Pasien DM Kelompok PERSADIA RS PKU Muhammadiyah Gamping Yogyakarta [Bachelor thesis]. Yogyakarta: University of 'Aisyiyah Yogyakarta; 2018. Indonesian
 17. Kalsum U. Hubungan Kualitas Tidur dengan Kadar Glukosa Darah pada Pasien Diabetes Mellitus Tipe 2 di Rumah Sakit Islam Cempaka Putih Jakarta Tahun 2013. *Jurnal Bidang Ilmu Kesehatan.* 2015 Jun; 5(1). Indonesian
 18. Yusnanda F, Rochadi RK, Maas LT. Pengaruh Kebiasaan Makan Terhadap Kejadian Diabetes Mellitus Pada Pra Lansia Di BLUD RSUD Meuraxa Kota Banda Aceh. *Jurnal Jurnal Muara Sains, Teknologi, Kedokteran, dan Ilmu Kesehatan.* 2017 Oct; 1(2):153-158. Indonesian
 19. Nur A, Fitria E, Zulhaida A, Hanum S. Hubungan Pola Konsumsi dengan Diabetes Mellitus Tipe 2 pada Pasien Rawat Jalan di RSUD Dr. Fauziah Bireuen Provinsi Aceh. *Media Litbangkes.* 2016; Sept 26(3):145-150. Indonesian
 20. Wicaksono R. Faktor-Faktor Yang Berhubungan Dengan Kejadian Diabetes Mellitus Tipe 2 [Bachelor thesis]. Semarang: University of Diponegoro; 2011. Indonesian
 21. Spiegel K, Leproult R, Cauter EV. Impact Of Sleep Debt On Metabolic And Endocrine Function. *Lancet,* 2008
 22. Brown MT, Bussell JK. Medication Adherence: WHO Cares?, *Mayo Clinic Proceedings* 86(4), 304-314, 2011

Published, Printed and Owned : Dr. R.K. Sharma

Printed : Printpack Electrostat G-2, Eros Apartment, 56, Nehru Place, New Delhi-110019

Published at: Institute of Medico Legal Publications Pvt. Ltd., Logix Office Tower, Unit No. 1704, Logix City Centre Mall Sector- 32,
Noida - 201 301 (Uttar Pradesh) Editor : Dr. R.K. Sharma, Mobile: + 91 9971888542, Ph. No: +91 120- 429 4015