Asian Journal of Healthcare Analytics (AJHA)
Vol. 3, No. 2, 2024: 105-120

Analysis of Diabetes Self-Management in Diabetes Mellitus Type 2 Patients in the City of Banda Aceh

Putri Amalia Ridwan[1], Husnah[2]*, Cynthia Wahyu Asrizal[3], Sakdiah[4]
[1]Medical Education Study Program, Faculty of Medicine, Syiah Kuala University
[2]Nutritional Science Department, Faculty of Medicine, Syiah Kuala University
[3]Department of Physiology, Faculty of Medicine, Syiah Kuala University
[4]Department of Biochemistry, Faculty of Medicine, Syiah Kuala University
Corresponding Author: Husnah, dr_husnah@usk.ac.id

A R T I C L E I N F O

Keywords: Type 2 Diabetes Mellitus, Diabetes Self-Management, Quality of Life

Received : 30, October
Revised : 14, November
Accepted : 28, November

A B S T R A C T

Type 2 diabetes mellitus (DM) can significantly impact quality of life (QoL). This study explores the relationship between diabetes self-management and QoL in type 2 DM patients in Banda Aceh. Conducted from November 13–30, 2023, the cross-sectional research included 100 respondents selected through proportional stratified random sampling across 11 health centers. Findings show 62% had good self-management, 16% moderate, and 22% poor. Meanwhile, 52% reported good QoL, and 48% poor QoL, with a positive correlation between self-management and QoL (p=0.000, r=0.512). Logistic regression revealed physical activity as the most significant self-management component influencing QoL (p=0.042). Better self-management improves QoL, emphasizing the importance of physical activity in managing type 2 DM.

DOI prefik: https://doi.org/10.55927/ajha.v3i2.12297
ISSN-E: 2963-9905
https://journal.formosapublisher.org/index.php/ajha

INTRODUCTION

International Diabetes Federation (IDF) confirm on end year 2021 that diabetes mellitus (DM) has become one of the most common health problems of the 21st century. The data shows that on year 2021, around 537 million peoples in all over world suffer diabetes, with projection reach 643 million in 2030 and 783 million in 2045. In Indonesia, the number of diabetes sufferers reaches 19.5 million soul, put the country This as order fifth with amount highest.[1]

The prevalence of diabetes in various provinces in Indonesia, such as Aceh Province, shows an increase from 2013 to 2018. The city of Banda Aceh also recorded a high incidence of diabetes (2.3%). Data health year 2018 show that diabetes type 2 occupies ranking sixth as disease take care road most in Public health center Banda Aceh.[2]

Diabetes mellitus influence quality of life Because disease This is disease period long Which No can heal. Although No can healed, management rate sugar blood with Good can minimize complications I and chronic, support objective main maintenance for increase quality of life sufferer.[3]

The Indonesian Endocrinology Association (Perkeni) emphasizes four main pillars in control diabetes, that is education, activity physique, therapy diet, And therapy pharmacology. In Indonesia, Ministry Health implements a chronic disease management program, including diabetes, through the Prolanis program. Diabetes self-management is key in controlling this disease, including adherence to diet, blood sugar measurement, drug therapy, foot care, health service utilization, and exercise. Although Good self-management can improve the patient's quality of life, many diabetes patients experience inability to carry out self-management, which can have a negative impact on physical aspects, psychological, social, And environment.[4]

A number of studies previously show connection positive between level self-management diabetes and quality of life of type 2 DM patients, although research results are not always consistent. Suantika Research (2015) about connection self-management diabetes with quality of life patient DM type 2 state that the higher the level of self-management, the higher the quality of life of type 2 DM patients.[5] Results Different research found by Siregar (2020) that there is no relationship between diabetes self-management with quality of life on diabetes mellitus patients.[6]

Research on the relationship between complex components of self-management and quality of life in diabetes sufferers has never been implemented before in the city of Banda Aceh. Based on study results introduction Which done by researcher from sixth respondent, four in among them Still Not yet succeed undergo good diabetes self-management. In addition, data regarding quality of life was also obtained through interviews with six diabetes sufferers, and three of them reported it decline quality of life which is considered bad.

Based on these findings, researchers are interested in continuing further related research "Relationship between Diabetes Self-Management and Quality of Life in Type 2 Diabetes Mellitus Patients in City Banda Aceh."

METHODOLOGY

Design analytic observational cross-sectional used in study This. Study held in 11 Community Health Centers in Banda Aceh City on program Post Coaching Integrated Non-Communicable Diseases (Posbindu PTM). Data collection from November 13 to November 30, 2023. Study This held after get agreement from Committee Ethics Study Health Faculty of Medicine, Syiah Kuala University with number ethical approval 192/EA/FK/2023.

The population is all patients with type 2 diabetes mellitus in 11 Community Health Centers in Banda Aceh City. Sample are patients who have been diagnosed with type 2 diabetes mellitus who come to the Community Health Center in Banda Aceh City Which fulfil criteria inclusion and exclusion. Taking sample This done use method probability sampling with proportional stratified random sampling technique at 11 Community Health Centers in Banda Aceh City. The sample size is calculated using a formula so that the minimum sample size is 95 peoples. Inclusion criteria are patients diagnosed with type 2 diabetes mellitus at least in the last 2 months, sign sheet informed consent for willing interviewed, has get education previously about the disease from a doctor, and aged 18 - 79 years. The exclusion criteria are respondents with disturbance hearing and limitations communication as well as No can do activity physique Because condition certain for example interference on system musculoskeletal.

Questionnaire Which used for measure self-management is Diabetes Self-Management Questionnaire (DSMQ) which measures a person's level of diabetes self-management which consists of 16 question manifold 10 statement with indicator control diet (No. 2, 5, 9, 13), activity physique (No. 8, 11, 15), and utilization service health (No. 3, 7, 14) and 6 question with indicator glucose management (No. 1, 4, 6, 10, 12, 16) and the results are reported in the form of a 0-3 Likert scale, so that the final total value from the range 0-48. Respondent with score 0-16 own self-management bad, score 16-23 self-management enough, and respondents with scores 24-48 own self-management Good.

The questionnaire used to measure quality of life is the Diabetes Quality-of-Life questionnaire (DQOL). Questionnaire DQOL developed by The Diabetes Controls and Complications Trial (DCCT) year 1998. This questionnaire was translated into Indonesian and modified into 12 question items by Chusmeywati in 2016. Respondents with a score < 45 had poor quality of life and a score of 45- 60 own quality of life are Good.

RESEARCH RESULT

Study done in 11 Public health centers on date 13 November until 30 November 2023. Table following show characteristics respondent: type sex, age, education, work, long suffer DM, therapy, and complications.

Table 1. Characteristics Respondent

Variable	Total	
	Frequency (n=100)	Percentage (%)

Type Sex		
Man	28	28
Woman	72	72
Age		
26-35 year	2	2
36-45 year	14	14
46-55 year	32	32
56-65 year	30	30
>65 year	22	22
Education		
Elementary School/Equivalent	14	14
SLTP/Equivalent	21	21
High school/equivalent	41	41
College Tall	24	24
Work		
No Work	78	78
Work	22	22
Long suffer		
DM		
0-5 years	54	54
>5 years	46	46
Therapy		
Insulin	16	16
OAD	73	73
Insulin+OAD	4	4
Diet	7	7
Complications		
There is	14	14
There isn't any	86	86

As seen in table 1 above, 72 respondents (72%) are women. 32% of respondents (32%) aged between 46 and 5 years. The majority had a high school education of 41 people (41%). Mostly status work respondents that is No Work 78 peoples (78%). Majority respondents suffer DM during 0-5-year totaling 54 people (54%). Most diabetes therapy uses anti-diabetes drugs (OAD), numbering 73 peoples (73%). Part big the patient does not experience complications totaled 86 peoples (86%).

Table 2. Description Level Self-Management Diabetes

Self-Management Level	Frequency (n=100)	Percentage (%)
Bad	22	22
Enough	16	16
Good	62	62

Table 2 in on show level self-management diabetes classified bad with amount 22 peoples (22%) and enough 16 peoples (16%).

Table 3. Description Level Self-Management Diabetes

Level Quality of Life	Frequency (n=100)	Percentage (%)
Bad	48	48
Good	52	52

Table 3 show the quality of life from respondents that classified bad with amount 48 peoples (48%).

Connection between Self-Management with Quality of Life

Table 4. Relationships between Self-Management Diabetes with Quality of Life

Self-Management Diabetes	Quality of Life				Total		*p value*	Coefficient correlation
	Bad		Good					
	n	%	n	%	n	%		
Bad	20	90,9	2	9,1	22	100		
Enough	10	62,5	6	37,5	16	100	0,000	0,512
Good	18	29	44	71	62	100		

Table 4 shows respondents with poor levels of diabetes self-management and quality of life bad a number 20 peoples (90.9%). On the contrary, on level self-management diabetes which Good and quality of life also Good has a number 55 peoples (71%). Test correlation Spearman show level strength Which big, showed with a p value of 0.000 ($\alpha<0.05$) and a correlation coefficient value of r=0.512. The type of relationship between the two variables have a positive relationship, namely the better the respondent's level of diabetes self-management, the more Good quality of life.

Partial Test Component Self-Management to Quality of Life

The self-management component according to the DQOL questionnaire consists of glucose management items, control diet, activity physique, and utilization service health, Test Wald used for test significance coefficients in multiple linear regression models. More specifically, the Wald test is used to determine whether the regression coefficient tested has a significant influence on the dependent variable in regression model linear multiple.

Glucose Variables Management

Table 5. Test Wald Glucose Management

Statistics Test *Wald*	df	*Sig.*
1,893	1	0.169

Based on table 5, mark significance Wald as big as 0.169 > 0.05, so with level real 5%, can concluded that glucose management has no influential significant on quality of life.

Variable Diet Control

Table 6. Test Wald Control Diet

Statistics Test *Wald*	**df**	***Sig.***
3,728	1	0.053

Based on Table 6, Wald significance value is 0.053 > 0.05, so with a real level of 5%, it can be concluded that control diet No influential significant on quality of life.

Variable Activity Physique

Table 7. Test Wald Activity Physique

Statistics Test *Wald*	**df**	***Sig.***
4,136	1	0.042

Based on table 7, mark significance Wald as big as 0.042 < 0.05, so with level real 5%, can concluded that activity physique influential significant on quality of life.

Utilization Variables Service Health

Table 8. Test Wald Utilization Service Health

Statistics Test *Wald*	**df**	***Sig.***
2,109	1	0.146

Based on table 8, mark significance Wald as big as 0.146 > 0.05, so with level real 5%, can concluded that utilization service health No influential significant to quality of life.

Equality Regression Logistics

Table 9. Equality Regression Logistics

Variable	**Coefficient**	**Exp (Q)**
Glucose Management (X_1)	0.194	1,214
Control Diet (X_2)	0.206	1,229
Activity Physique (X_3)	0.214	1,239
Utilization Service Health (X_4)	0.279	1,321
Constant	-7,791	0,000

In logistic regression, the regression coefficients cannot be interpreted directly. Interpretation Logistic regression uses the odds ratio, namely the

exponent of the regression coefficient and is interpreted in form opportunity. Interpretation model regression as following:

Glucose Management

The odds ratio for Glucose Management is 1.214, meaning someone who has Good glucose Management is 1.214 times more likely to have a good Quality of Life than someone who do not have Good Glucose Management. However, there is no significant influence.

Control Diet

Big odds ratio Control Diet as big as 1,229 It means somebody Which do Control Diet Which Good 1.229 times more likely to have a good Quality of Life than someone who does not Diet Control. However, No so significant its influence.

Activity Physique

Big odds ratio Activity Physique as big as 1,239 It means somebody Which do Activity Physique Which Good tend 1,239 time will own Quality of Life Which Good than somebody Which No do Activity Physical and influential significant.

Utilization of Services Health

Big odds ratio Utilization Service Health as big as 1,321 It means somebody Which Utilizing Health Services well is 1.321 times more likely to have a better Quality of Life better than someone who does not utilize Health Services. However, it is not that significant its influence.

Table 10. Pseudo R Square

Nagelkerke R Square
0.332

Nagelkerke R Square value or also called Pseudo R Square is 0.332, indicating that ability Glucose Management, Control Diet, Activity Physique, and Utilization Service Health in explaining the Quality of Life variable is 0.332 or 33.2% and there is 100% - 33.2% = 66.8% factor other outside model Which explains the Quality of Life variable.

DISCUSSION

Characteristics General Respondent

Majority respondents aged between 46 And 55 year, with amount 32 peoples (32%) Which enter in category elderly early, based on data study Which done in 11 Public health centers in City Banda Aceh with sample of 100 DM patients. One of the risk factors for type 2 diabetes is increasing age. Insulin hormone the more seldom produced along increase age, so that increase opportunity they caught diabetes mellitus. According to Wulansari & Isfandiari

(2013), insulin resistance is caused by decline ability insulin in transport glucose in a way effective to in cell along with increase age.[7]

Based on type her gender majority respondents Woman with amount 72 peoples (72%). Finding similar Also seen on study Cut Najwa year 2019 Which done in Polyclinic HOSPITAL Zainoel Abidin Banda Aceh City: 54.8% of DM patients are women. 8 Because the muscles and liver are more sensitive to the effect's insulin, more women than men suffer from diabetes mellitus. Estrogen regulates levels blood glucose, and variations in estrogen levels can impact this regulation. Insulin resistance is an effect side general from enhancement rate hormone estrogen in body. Woman Also more Possible experience fat accumulation compared to men, thereby increasing the risk of impaired insulin sensitivity in they.[9,10]

The results of this research also show that 41 respondents had a high school education (41%) and the majority of respondents did not work, namely 78 people (78%). Of all respondents, 54 people (54%) suffer DM during 0–5 year, whereas 46 people (46%) suffer DM more from 5 year. Results This in line with study Nur Ramadan year 2018 in Public health center Jaya New Banda Aceh, that is majority respondents suffer DM at time range 0-5 year.[11]

The duration of suffering from DM in this study was calculated from patients diagnosed with DM, so it cannot be calculated conclude with Good duration Actually patient the experience DM Because Can just patient the had suffered from DM long before it was diagnosed. Calculating the duration of experiencing DM is usually done for estimate complications. Complications usually appear after 10-year experience DM because changes physiological Which caused by condition resistance insulin on disease diabetes mellitus.[12]

Based on patient therapy data, the majority of respondents underwent therapy with anti-diabetic drugs (OAD) with a total of 73 people (73%) followed by insulin therapy with a total of 17 people (17%). These results are in line with with study Which done on year 2019 by Aulia Womb in RS Ironwood Banjarmasin Which find that form preparation drug antidiabetic orally (77.6%) more often given compared to insulin (22.4%).[13] Insulin is used as a last resort treatment of type 2 diabetes when oral antidiabetic drugs (OAD) failed to provide the desired results. Patients can receive more insulin treatment easily in hospitals and other advanced health facilities under the National Health Insurance system (JKN) existing compared in institution other health.[14]

Based on the complications experienced by patients, the majority of respondents had no complications with a total of 86 peoples (86%) compared to experience complications with amount 14 peoples (14%). Matter This in line with results Alfad's research in 2022 at the Ulee Kareng Community Health Center, namely that the majority of respondents had no complications with amount 56 peoples (67.5%).[15] Study Dita Novita Sari Which done on year 2022 in RS Muhammadiyah Palembang produce findings Which contradictory, that is 16.1% participant experience DM type 2 without symptom and 51.3% experience complications chronic.[16]

According to assumption researcher, matter This estimated Because average patient diabetes with complications chronic usually prefer to carry out

control and treatment and get a referral to a health facility level carry on like House Sick.

Description Self-Management Diabetes

Results study obtained majority level self-management diabetes respondents classified Good with amount 62 peoples (62%), whereas for self-management diabetes bad amount 22 peoples (22%) And Enough totaling 16 people (16%). These findings are consistent with a 2018 study conducted by Dhamayanti in Bandar Lampung, which found that a higher percentage of participants was 78 respondents, or 80.41% own level excellent self-management of diabetes sufferers.[17]

One other aspect of self-management is the use of health services. Based on research, the majority of patients took medication according to the doctor's prescription. In this research it was also found Most DM patients get high scores on aspects of health service utilization. This matter caused part big patient DM follow activities and monthly check-up very in posbindu.

Cut Najwa's 2019 research at the RSUDZA endocrine polyclinic found the majority of respondent's own self-management diabetes Enough with 72.7%.8 Self-Management diabetes can influence by a number factor. Various aspect, like knowledge, culture, aspect emotional, motivation, and pattern life, has the potential to impact how a person manages their diabetes.[18] Self-Management of diabetes mellitus very influenced by factor culture. In Indonesia, especially in Aceh, Which majority its inhabitants religious Islam, a number of cultures like operate worship fast every month Ramadan and tradition "meugang" moment welcome day kingdom Eid Fitri can become obstacle in undergo therapy diabetes Which appropriate Because habit Eat And break the fast fast in amount big. By Because That, pattern diet diabetes Which recommended needs to be adapted to the context that culture.[19]

Acehnese people have a penchant for consuming sweet, salty and fatty foods. 52.3% Aceh residents report consuming sweet foods or drinks more than once a day. One of factor risk disease diabetes mellitus is method Eat public Aceh. There is Also culture public Which Already become tradition in Banda Aceh is habit drink coffee daily Good Morning, Afternoon, afternoon And Evening.[20] Consume coffee Which added sugar influential to tolerance glucose.[21] Factor knowledge Also can influence a person's level of self-management. Hussain's research in 2019 showed that knowledge limited about self-management diabetes hinder patient diabetes mellitus for carry out behavior self-management diabetes.[22]

Physical exercise is an initial effort to manage DM.[23] Frequent exercise can improve quality of life and glycemic management. Diabetes mellitus sufferers can benefit from three times 30 minutes of exercise per week, which can improve insulin efficacy over a 24 to 72 O'clock. Matter This happen consequence ability activity physique Which Enough intense in arrange sugar blood.[24] From interview Which done by researcher about self-management diabetes obtained score average Lowest respondents there is on item question about activity physique. A number variable Which contribute between other is

reluctance and ignorance respondents will importance activity physique in lower rate blood sugar, as well as busy activities such as farming, selling, or being a housewife, which hinders it they to exercise.

Description Quality of Life

Results study based on quality of life respondent, obtained level bad quality of life amount 48 peoples (48%). According to study Joyce (2015), 19 respondents (63.3%) sufferer diabetes mellitus own quality of life Which tall, whereas 11 respondents (36.7%) own quality of life which bad.[25]

Perception somebody to health and his welfare in a way whole, which covers aspect social, psychological, and physique in his life, known as quality of life. So far where somebody like his life can understood as impact and satisfaction Which he obtained in operate his business daily. Matter This known as quality of life.[26]

Connection between self-management diabetes with quality of life

The null hypothesis was rejected based on the findings of the Spearman correlation statistical test, which showed a value of $p = 0.000$ ($\alpha<0.05$). This shows that self-management diabetes and quality of life are closely related significant in type 2 diabetes mellitus patients in Banda Aceh City. With a correlation coefficient of 0.512 proven second variable have connection Which Enough big. Especially number This positive. Matter This shows that there is a positive relationship between these two variables, namely the quality of life of respondents increases along with level self-management diabetes.

The research findings also revealed that 71% of respondents carried out self-management practices independent diabetes, which effective own quality of life which is Good, compared to with 90.9% respondents Which engage in poor self-management diabetes practices. This is caused by the majority of DM patients Participate in activities and inspections once a month at Posbindu. The findings of this research are strengthened by a number of studies, including one conducted in 2019 by Iskhim Lutfa, found that there is connection between quality of life patient diabetes type II with ability they control his diabetes.[27]

Connection Which tightly between self-management and quality of life can explained through objective self-management, that is reach control maximum to rate sugar blood and reduce risk long term complications. Self-management and quality of life are significantly correlated due to diabetes mellitus (DM) is a chronic disease that affects psychological, social and physical elements of life period long.[28]

Self-management skills are individual efforts to improve chronic disease management to achieve optimal health and well-being. Quality of life is a frequent ideal criterion applied when discussing chronic diseases as well as being a conceptual measure of capacity individuals to be independent in carrying out daily tasks, ensuring their existence, and achieving circumstances prosperous. Success in self-management can materialized when somebody own skill and adequate knowledge for overcome diabetes mellitus in a way independent.[29]

For sufferer diabetes mellitus, self-management very important for guard control sugar blood still ideal and avoid various problems that can be caused by this disease. While managing diabetes Alone, there is a number factor Which need considered, including nutrition, sport, monitoring sugar blood, and use medical services.[30]

Based on findings study, 55% participant own trend for skip activity Which scheduled in a way physique. Sport is Wrong One method for start manage diabetes. Exercising in a way regular can increase quality of life somebody and glycemic management. Sufferer DM Can benefit from three 30-minute bouts of exercise per week, which may increase efficacy insulin within 24 to 72 hours. This happens due to high intensity physical activity can control glucose well.[31]

The next self-management is control diet, obtained results that 62% respondents sometimes Still eat food sweet or food Which rich carbohydrate. Inability control food can cause blood sugar instability.[32] Results of Husnah's research in 2016 in the Puskesmas work area Ulee Kareng own pattern dietetics Which No in accordance. Reason the most is lack of education by local health workers. Therefore, it is recommended that related parties educate DM patients regarding appropriate dietary arrangements for managing diabetes mellitus in order to achieve adequate glucose levels under control on DM sufferers.[33]

The other two aspects, namely glucose management and health service utilization, were obtained results Which Enough Good, that is 74% respondents tend No avoid inspection doctor Which related with diabetes. Aspect of glucose management including inside it that is regularity inspection rate sugar blood and medication adherence as one of the important pillars in controlling diabetes mellitus. From results study obtained that respondents majority has drink drug in accordance with recommendation Which given poleh doctor. According to study Caliph (2014) education about dose drug, type drug Which normal consumed by diabetes mellitus sufferers, and the effect of taking medication regularly can help improve obedience drink drug in application self-management.[34]

Diabetes mellitus is a condition that must be managed over time; if not, patient may experience problems that reduce their quality of life. Diabetes complications, which can cause organ death in whole body, can prevented by self-management which consistent. Complications This cause suffering Which prolonged for patient, Good in a way physique nor mental, and lower quality of their life.[28]

Component Self-Management Activity Physical Influence Significant to Quality of Life

Of all the components of the questionnaire questions regarding self-management, physical activity items are component Which most influential significant with quality of life. Study This in line with Sendow's research (2017) states that physical activity is closely related to quality of life.[35] WHO (2010) states that increasing physical activity is very important, especially in adults and the elderly age, due to the increased risk of various diseases associated with increasing age.[36] Physical activity enough to help avoid disease, especially

non-communicable diseases. Apart from that, it can improve body fitness and health, and prevent the possibility of depression, which in Ultimately it can improve a person's quality of life.[37] Increased physical activity is associated with taste lower pain, lower risk of injury, better physical and emotional health, and better quality of life.[38] This supports the findings made by Tambariki (2012) that there is correlation significant between quality of life and exercise physique.[39] Activity physique can help feel Better, increase well-being, reduce risk diabetes mellitus and disease chronic other, and reduce decline function body due to aging.[40]

Physical exercise has a positive impact on individuals who have normal insulin sensitivity nor resistance insulin. Activity physique can increase absorption glucose without involve mechanism insulin, with increase expression GLUT-4 Which related with membrane plasma and tubule T in response to contraction. This results in positive changes in glucose transport and metabolism, as well as improving the regulation of glucose production by the liver. This benefit in particular means a lot for individuals who suffer from diabetes type 2. [41]

Overall blood sugar control can be improved by exercising regularly because improves insulin sensitivity and improves glucose tolerance. This health benefit can also be lower risk complications diabetes period long, slow down development complications Which Already exist, and improve the quality of life. Participation in physical activity can improve sugar control blood on people with diabetes type 2. [42]

CONCLUSIONS

(1) The majority of respondents were female (72%), aged 46-55 years (32%), with at least high school education (41%), not working (78%), suffering from DM 0-5 years (54%), undergoing therapy with OAD (73%), and without complications (86%).
(2) Description of the self-management diabetes that bad are 22 people (22%) and enough 16 people (16%).
(3) Description of the quality of life that Good are 52 people (52%) and bad 48 people (48%).
(4) There is connection which significant between self-management diabetes with quality of life patient diabetes mellitus type 2 in Banda Aceh City.
(5) The component of self-management that has the most significant influence on quality of life is activity physique.

RECOMMENDATIONS

(1) Promote Physical Activity: Develop community-based programs to encourage regular exercise tailored to type 2 DM patients.
(2) Strengthen Education Programs: Offer workshops on self-management strategies, focusing on diet, medication, and stress management.
(3) Leverage Technology: Introduce mobile apps for tracking blood sugar, activity, and medication adherence to support self-management.

(4) Enhance Healthcare Support: Train healthcare providers to deliver personalized counseling for improved physical activity and self-management.
(5) Policy Initiatives: Advocate for accessible recreational facilities and programs specifically designed for diabetes management in Banda Aceh.

ADVANCED RESEARCH

Study Limitations:

(1) Cross-Sectional Design: The study's design captures a snapshot in time, limiting the ability to establish causal relationships between diabetes self-management and quality of life.
(2) Geographical Scope: The research is restricted to health centers in Banda Aceh, which may limit generalizability to other regions with different healthcare infrastructure or cultural practices.
(3) Self-Reported Data: The reliance on self-reported questionnaires may introduce response bias, as participants might overestimate or underestimate their self-management practices and quality of life.
(4) Limited Variables: While physical activity was identified as a key factor, other components like dietary adherence, psychological health, and social support were not comprehensively explored.

Suggestions for Further Research:

(1) Longitudinal Studies: Conduct studies over time to explore causal relationships between self-management components and quality of life improvements in type 2 diabetes patients.
(2) Broader Populations: Expand the research to include diverse geographical areas and populations to increase generalizability.
(3) Holistic Approach: Investigate additional factors influencing quality of life, such as mental health, social support systems, and adherence to dietary recommendations.
(4) Technology Integration: Examine the effectiveness of digital health interventions, such as mobile applications, wearable devices, or telemedicine, in enhancing diabetes self-management.
(5) Comparative Studies: Compare different self-management programs or interventions to identify the most effective strategies for improving quality of life in type 2 diabetes patients.

REFERENCES

IDF Diabetes Atlas 10th edition [Internet]. Available from: www.diabetesatlas.org

RISKESDAS. Report Aceh Province RISKESDAS 2018. 2018.

Mandagi A. Factors Associated with the Quality of Life Status of Diabetes Mellitus Patients in Public health center Fern Sawahan District City of Surabaya. Repos Univ Airlangga. 2010;

PERKENI. Consensus on the management and prevention of type 2 diabetes mellitus in Indonesia. PB Perkeni. 2015;

Suantika P. The Relationship between Diabetes Self Care and the Quality of Life of Type 2 DM Patients in the Polyclinic Internal. J Nursing Science FK UNUD. 2015;3(1).

Siregar M, Lasmawaty S. Diabetes Mellitus at Mitra Medika Medan General Hospital Relationship of Diabetes Self Care and Quality of Life Diabetes Mellitus Patients in RSU Mitra Medica Medan. 2020; 2:92–8.

Wulandari Y., Isfandiari A. The Relationship between Metabolic Syndrome and Lifestyle with Symptoms of Complications Microvasculature. J Berk Epidemiology. 2013;1(2).

Zuqni CN. The Relationship between Self-Management and Current Blood Glucose in Diabetes Patients Type II Mellitus at the Endocrine Polyclinic at Dr. Regional General Hospital. Zainoel Abidin Banda Aceh. University Syiah Kuala; 2019.

Polit DF, Beck C. Generating and Assessing Evidence for Nursing Practice (9th eds.). Sampling in Quantitative Research;

Bintanah S, Handarsari E. Fiber Intake with Blood Sugar Levels, Total Cholesterol Levels and Status Nutrition in Type 2 Diabetes Mellitus Patients at Roemani Hospital Semarang. LPPM Unimus [Internet]. 2012; 001:289–97. Available from: journal.unimus.ac.id/index.php/psn12012010/article/download/522/571

Ramadhan N, Marissa N, Fitria E, Wilya V. Control of type 2 diabetes mellitus in patients in Public health center Jayabaru City Banda Aceh. Media Researcher and Developer Health. 2018;28(4)

Ni Wayan Trisnadewi O, Anita Pramesti T, Ketut Lisnawati N, Idayani S, Gst Pt Agus Ferry Sutrisna Son I, Hero Medica Bali Stick. Self-Management Education Increase Quality of Life Patient Dm Type 2. JPM J Pengabdi Mandiri. 2022;1(3). Available from: http://bajangjournal.com/index.php/JPM

Rahim A, Rusiyana, Purwatini L. Treatment Profile of Outpatient Diabetes Mellitus Patients at the Depo General Pharmacy Rsud Ironwood Banjarmasin Period January – March 2019. 2021;17(4):46–52.

Fitriani Y, Pristianty L, Hermansyah A. Health Belief Model (HBM) Approach to Analyzing Compliance of Type 2 Diabetes Mellitus Patients in Using Insulin. Pharm J Farm Indonesia (Pharmaceutical J Indonesia. 2019;16(2):167.

Umra AD, Zahara M, Aramico B. Factors that influence the quality of life of diabetes sufferers Mellitus Type-2 In Public health center Ulee Kareng, Banda Aceh 2022. 2023;4(September):2015–21.

Novitasari DI. Characteristics of Patients with Diabetes Mellitus Type 2 That Were Hospitalized in Patar Love Hospital Deli Serdang Regency. Jambura J Heal Sci Res. 2022;4(3):677–90.

Fitriani Antika D. Relationship between diabetes self-management and blood sugar control in diabetes patients Mellitus Type II in Prolanis Participants in Bandar Lampung. 2018.

Schulman-Green D, Jaser C. A metasynthesis of factors affecting self-management of chronic illness. J Adv Nurs. 2016;72(7).

Marzuki M. Meugang Tradition in Acehnese Society: An Interpretation of Religion in Culture [Internet]. Vol. 16, 216 el Harakah. 2014. Available from: http://nursyam.uinsby.ac.id

Putri R, Diansari V, Sundari I. The effect of Acehnese ulee kareng coffee on the hardness of denture bases acrylic resin Effect of ulee kareng Aceh coffee the hardness of acrylic resin denture base. J Dentomaxillofacial Sci. 2011;

Rahajeng E. The Effect of Coffee Consumption on the Incidence of Type 2 Diabetes Mellitus. Gizi Indonesia. 2010;

Mikhael E, Hasalli M. Self-management knowledge and practice of type 2 diabetes mellitus patients in Baghdad, Iraq. Metab Syndr Obes Targets Ther. 2019;

Rondonuwu R, Rompas S, Bataha Y. The relationship between exercise behavior and blood sugar levels Diabetes Mellitus Sufferers in the Wolaang Community Health Center Working Area, East Langowan District. Nursing ejournal (e-Kp). 2016;

Liana A, Soharno, Panjaitan A. The relationship between knowledge about balanced nutrition and the index Period Body on student. J Obstetrics. 2017;

Laoh J, Tampongangoy D. Description of the Quality of Life of Diabetes Mellitus Patients in the Polyclinic Endocrine Rsup Prof. Dr. R. D. Kandou Manado. JUIPERDO. 2015;

Yusro A. The Relationship between Family Support and Quality of Life in Type Diabetes Mellitus Patients 2 at the Polyclinic Disease Inside the house Sick Fatmawati Center General Jakarta. 2011;

Luthfa I. Implementation Self-care Activity Sufferer Diabetes Mellitus in Region Public health center Bangetayu Semarang. Bul Researcher Health. 2019 Jun 19;47(1):23–8.

Mulyani S. Relationship between Self-Management of Type II Diabetes Mellitus Patients and Blood Sugar Levels In the hospital Banda Aceh City. CELL. 2016;3(2).

Chairir R, Wahyuni A, Furkhani D. Connection Self Care with Quality of Life Patient Diabetes Mellitus. J Endur. 2017;2(2):132.

Schmitt A, Gahr A, Hermanns N, Kulzer B, Huber J, Haak T. The Diabetes Self-Management Questionnaire (DSMQ): Development and evaluation of an instrument to assess diabetes self-care activities associated with glycemic controls. Health Qual Life Outcomes. 2013 Aug 13;11(1).

Handayani D, Yudianto K, Kurniawan T. Self-management behavior of diabetes mellitus (DM) patients. J Nursing Padjadjaran. 2013;1(1).

Susanti, Nobel Bistara D. The Relationship between Diet and Blood Sugar Levels in Diabetes Sufferers Mellitus (The Relationship between Diet and Blood Sugar Levels in Patients with Diabetes) Mellitus. J Health Vocational [Internet]. 2018;3(1):29–34. Available from: http://journal.ugm.ac.id/jkesvo

Husnah H. Dietetic Overview of Diabetes Mellitus Sufferers at the Ulee Kareng Community Health Center, Banda Aceh. J Syiah Kuala guise. 2016;16(3).

Kholifah N. Self-Management Intervention increasing compliance in patients with DM. J Ners. 2014;9(1).

Sendow A., Wariki W, Kandou G. The Relationship Between Income and Physical Activity and Quality of Life on Resident in the Village Group Subdistrict Central Tomohon City Tomohon. 2017;

WHO. Global recommendation on physical activity for health. 2010;

Cicillia L, Kaunang WP., Langi FLF. Relationship between physical activity and the incidence of diabetes mellitus On Patient Care Walk in House Sick General Area Bitung City. 2018;

Theou O, Rose D. Physical Activity for Successful Aging in. In: Textbook of Geriatric Medicine and Gerontology. 2016.

Tambariki J. Physical Exercise and Quality of Life in the Elderly in Dimembe District, Regency Minahasa North. JKU. 2012;1(1).

Waworuntu G., Arifuddin A. Relationship between physical activity and hypertension and Quality of Life Elderly in Tondegesan Village Subdistrict Kawangkoan Regency Minahasa. 2019;

Hoeger W, Hoeger S. Principles and labs for fitness and wellness. 2004;

RJ S, GP K, DH W, C CS. Physical activity/exercise and type 2 diabetes. Diabetes Care. 2004;