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EFFECT OF LIFESTYLE MODIFICATION EDUCATION ON QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES IN KADUNA, NIGERIA

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ABSTRACT

Diabetes mellitus and its management pose significant public health problems for healthcare workers. Diabetic patients in the community frequently experience avoidable, debilitating, disabling, and unpleasant illnesses, owing mostly to poor lifestyle practices and a lack of understanding. Hence, this study aims to assess the effect of lifestyle modification education on the quality of life of diabetic patients in the Samaru Community. The research design employed for this study was a quasi-experimental approach using a pre-test and post-test methodology. The study population consisted of ninety (90) patients with type 2 diabetes mellitus residing in the Samaru Community. Data collection utilized the World Health Organization Quality of Life (WHOQOL-BREF) instrument, which was adapted from the World Health Organization. Descriptive and inferential statistical analyses were conducted to examine the collected data and test the hypothesis. Demographic findings revealed that 85% of the respondents were female, and 87% had received some form of education. The study results indicated that both the study and control groups had a fair perception of quality of life before the intervention. Furthermore, the study observed that the level of perception of quality of life before the intervention was fair (43.6%), while after the intervention, the percentage of respondents with a positive perception increased to 60.6%. Additionally, the findings indicated no significant effect in the aggregate mean score for the five domains of lifestyle modification education on the study and control groups' perception of their quality of life before the intervention ($P=0.89$). However, a significant effect was observed in the aggregate mean score for the five domains after the intervention ($P=0.07$). Lastly, the results revealed that exposure to lifestyle modification education had a significant impact on the study group's perception of their quality of life ($P < 0.001$). Based on these findings, the researcher concludes that lifestyle modification education positively influences the quality of life of

diabetic patients. It is recommended that nurses, through their respective healthcare units, be encouraged to utilize lifestyle modification education as a non-pharmacological management approach to improve the quality of life for diabetic patients.

Keywords: Lifestyle Modification Education; Quality of Life; Diabetic Patients

INTRODUCTION

Diabetes mellitus (DM) is a prevalent disease that poses a significant global public health challenge due to its increasing prevalence. The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014 (WHO, 2021). In 2021, the prevalence of diabetes is 463 million in the world. In Africa, it is 19 million, with 6 million cases living with the disease in Nigeria (WHO, 2021). Diabetes poses very serious complications like heart attacks, stroke, blindness, kidney failure, and lower limb amputation. According to the International Diabetes Federation (IDF, 2021), a person dies from diabetes mellitus every 5 seconds. Diabetes has a significant impact on the quality of life of individuals affected by the condition. At least 90% of patients with diabetes have type 2 diabetes (IDF, 2016). Prevention of or delay in the onset of type 2 diabetes can be achieved by eating healthy diet, having regular physical activity, maintaining normal body weight, and side-stepping tobacco (WHO, 2021). Also taking any necessary medications, can prevent these complications. (Hess-Fischl and Lisa, 2019).

Poor lifestyle is one of the risk factors that exposes an individual to non-communicable diseases like diabetes. These lifestyles include inactivity, poor eating habit, smoking, or

excessive intake of alcohol. The stated factors are modifiable in order to improve the quality of life of patients. Lifestyle modifications including cessation of tobacco smoking, changes in diet, and exercise are recommended as non-pharmacological therapeutic approaches for the management of obesity-associated diseases including diabetes and insulin resistance (Garber, Abrahamson, and Barzilay, 2019). A healthy lifestyle increases life expectancy, improve relationships, improve mobility, prevent overweight, prevent long term illnesses such as diabetes, reduce stress and prevent depression and promote confidence and self-esteem (BBC, 2022).

The World Health Organization identified six key life areas of quality of life which include social relationships, psychological wellbeing, level of independence, religion and spirituality, physical health, and the environment (Sexton, 2016) these identified areas made up what today became the domains of quality of life. Quality of life in communities can be improve by investing in education at the primary and secondary level, (Kagan and James, 2021). Quality of life is said to be the degree to which an individual is healthy, comfortable, and able to participate in or enjoy life events. Within the arena of well-being, quality of life is viewed as multidimensional, covering emotional, physical, material, and social well-being, (Kagan, 2021). Kagan further stated that quality of life is influenced by an individual's physical and mental health, the degree of independence, the social relationship with the environment, and other factors.

The approach to the measurement of the quality of life derives from the position that there are several domains of living. Each domain contributes to one's overall assessment of the quality of life. The domains include family and friends, work, neighbourhood (shelter), community, health, education, and spiritual (Palamenghi, Carlucci, and Graffigna, 2020). Questioning and measuring the quality of life is important, as it helps us to understand what factors are associated with better or worsening quality of life (Sexton, 2016). The quality of life

(QoL) concept now includes new aspects related to patients' well-being because QoL has become more of a personal perception than an objective and measurable entity (Cai, Verze, Bjorklund and Denmark, 2021). Standard indicators of the quality of life include wealth, employment, the environment, physical and mental health, education, recreation and leisure time, social belonging, religious beliefs, safety, security and freedom (Gupta, Kapoor, & Sood, 2021).

Anecdotal observation highlights the presence of poor lifestyle practices among diabetic patients in the community, leading to complications and adverse outcomes. This can be attributed to a lack of knowledge regarding lifestyle modification, inadequate tracking and monitoring measures, and insufficient involvement of patients in their healthcare management plans. The decline in patients' condition underscores the importance of educating and mobilizing this group on lifestyle modification, including healthy diet, regular physical activity, weight management, and avoidance of tobacco use. By addressing these factors, the risk of developing complications can be controlled and reduced, ultimately promoting a better quality of life for diabetic patients in the communities. The identified gap pertains to the limited number of studies conducted in Nigeria, specifically in Kaduna state, that assess the impact of lifestyle modification education on the quality of life among diabetic patients.

Intervention process

Literature search revealed the interventions aimed at reducing complications and enhancing the quality of life for diabetic patients were identified. Building upon this existing knowledge, a study was designed to assess the impact of lifestyle modification education as an intervention. A session plan was developed, focusing on key areas such as knowledge, exercise, nutrition, and self-care management. Through home visitation, self-reported type 2 diabetic patients were identified as the target group. A total of 90 patients were selected, with 45 assigned to the control group and 45 to the study group. The study group received

the intervention along with informative posters on the respective topics. The health education intervention was conducted over a duration of one hour and thirty minutes, followed by continued follow-up and reinforcement reminders for twenty-two weeks. To ensure accurate data collection, six research assistants were recruited and trained in administering research instruments and gathering information from the participants.

Evaluation of the lifestyle modification education intervention

To measure the effectiveness of the intervention, a World Health Organization

quality of life (WHOQOL BREEF 26) twenty-six item instrument was adopted to ascertain the effect of lifestyle modification education on the QOL for patients participating in the study. The aim of the assessment was to evaluate each patient's perceived quality of life (QOL) before they had the intervention (pretest) and then twenty-two weeks after intervention (post-test) to record whether there had been any change in the patient's perceived quality of life, after they had received the intervention. All data collected were analysed using descriptive and inferential statistical tools as presented in procedure for data analyses in the research methodology.

Table 1: Theoretical Framework

Domains	Sub domains	Meaning	Aspects
BEING	Physical being	Basic things of “Who one is”	Physical health, Personal hygiene Nutrition, Exercise, Grooming, Clothing Exercising
	Psychological being	Person’s psychological health and adjustment	Cognition, Feelings Evaluations Concerning the self and self-control
	Spiritual being	Reflects personal standards	Personal values Standards of conduct Spiritual belief
BELONGING	Physical belonging	Connecting the persons with his/her physical environment	Home, Workplace, Neighbourhood Schools and community
	Social belonging	Mingling with Social environment	Sense of acceptance with other family friends, co-workers, neighbourhood, and community
	Community belonging	Access of obtainable Resources to community Members	Adequate income, health and social services, Employment Educational and Recreational programs Community activities
BECOMING	Practical becoming	Day-to-day actions	Domestic activities, Paid work Volunteer activities, Health needs
	Leisure becoming	Promote relaxation and stress reduction	Games, Neighbourhood walk Family visit, Tourism
	Growth becoming	Promoting knowledge and skills	Accomplishing/achieving goal and need

Quality-Of-Life Model by Barcaccia *et al.*, (2013) And Rathi and Kumari, (2020)

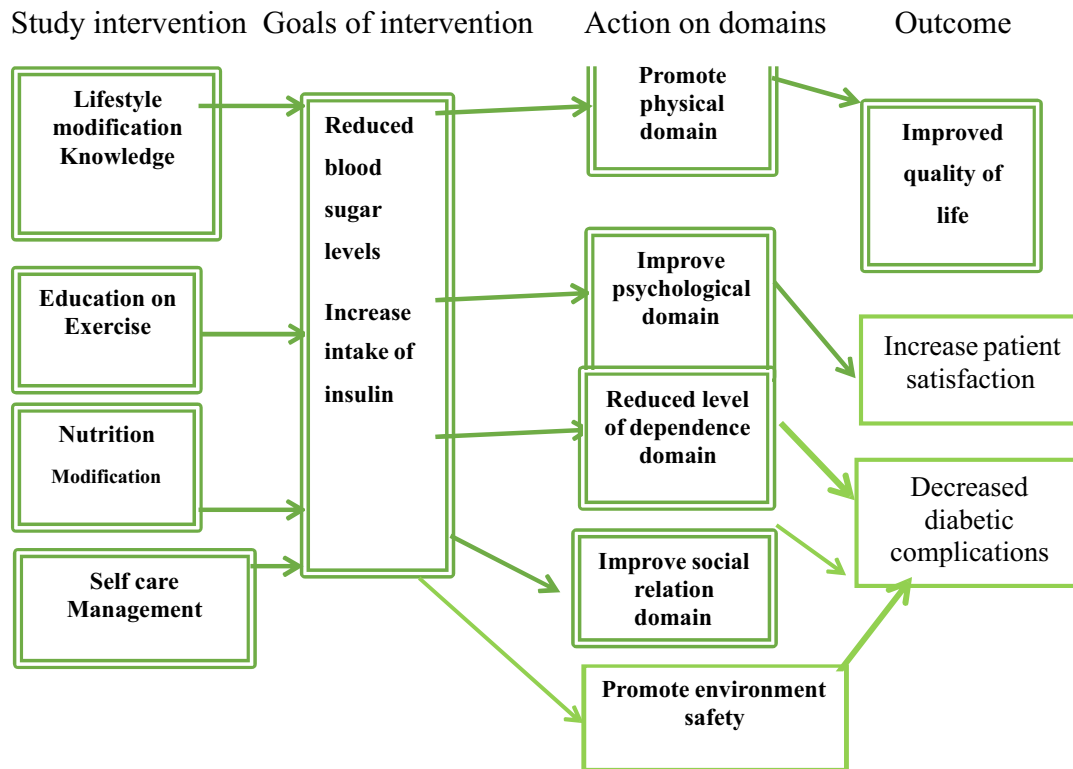


Figure 1: Effects of lifestyle modification, Intervention on Quality of life among Diabetic patients, (source: A. B. Umar)

Research questions

1. What is the perceived quality of life of diabetic patients before intervention?
2. What is the Effect of the Lifestyle Modification Education on the study group's Perception of their Quality of Life

Hypotheses: There is no significant difference in the perceived quality of life of the study group before and after intervention.

METHODOLOGY

The study is grounded in a positivist philosophy, which advocates for the use of quantitative research methods to ensure precision in describing parameters and coefficients within the gathered, analyzed, and interpreted data. This approach facilitates the understanding of relationships embedded in

the data (Kivunja and Kuyini, 2017). The study employed a quasi-experimental design with a pre-test-post-test control group. All ninety (90) patients diagnosed with type 2 diabetes were included in the study. The total population sampling technique was utilized due to the relatively small population size. This approach minimizes the risk of overlooking insights from excluded members and enables analytical generalizations about the study population (Lead dissertation, 2012).

Data was collected using the WHOQOL-BREF, a 26-item instrument adapted from the World Health Organization Quality of Life (WHOQOL) (Szabo et al., 1998). The instrument consists of closed-ended questions and emphasizes the individual's perception. It assesses the functioning and satisfaction of patients across various domains related to quality of life. The instrument comprises six sections (A-F): Section A focuses on physical health, Section B on psychological health, Section C on level of independence, Section D on social relations, and Section E on the environment.

Validity and reliability:

The English version of the questionnaire was translated into Hausa by a language expert from the Faculty of Languages. Face validity and content validity were then assessed to ensure the questionnaire's accuracy and appropriateness. Face validity was evaluated by administering the questionnaire to a small group of diabetic patients to assess aspects such as clarity, relevance, terminology, grammar, and overall understandability. Content validity was assessed by five experts from the fields of medicine and nursing to evaluate the qualitative aspects of content validity.

To determine the quantitative content validity, both content validity index (CVI) and content validity ratio (CVR) were calculated. The adopted instrument, WHOQOL-BREF, has undergone testing and validation by experts from the World Health Organization (WHO). It has been proven to be a valid and reliable tool for assessing the quality of life of patients and is approved for such purposes. The instrument is available for educational purposes on the WHO website: <https://www.who.int.media> (Szabo et al., 1997).

Method of Data Collection: The research study obtained ethical approval from the Ministry of Health and Human Resources to ensure the ethical conduct of the study involving human subjects. Additionally, permission was obtained from the community leader of Samaru Community to access and recruit respondents for the study. These measures were taken to adhere to ethical guidelines and ensure the rights and well-being of the participants throughout the research process.

Accessing the respondents: Home visitations were conducted, during which a questionnaire was administered to collect information regarding the respondents' demographic details and medical history. The questionnaire included specific inquiries about whether the respondents were diagnosed with diabetes. To validate the diabetic status of the patients, their

clinic cards were observed. At the conclusion of the survey, a total of one hundred (100) self-reported diabetic patients were recorded.

Recruitment of respondents for the study:

The recruitment process for the study involved clustering the community's eleven wards into two groups: Cluster A and Cluster B. Cluster A was designated as the control group, while Cluster B was assigned as the study group. To minimize the influence of confounding factors, a distance of one kilometre was maintained between the two groups. For the study, forty-five respondents were recruited for both the control and study groups. To ensure similarity between the two groups, their personal characteristics were assessed, revealing that they were all confirmed type 2 diabetic patients, attending the same clinic, and predominantly belonging to the 40-59 age group. Additionally, most participants in both groups were self-employed and had a secondary education. To accurately evaluate the intervention's effects, it was necessary to have both a treatment group and a control group assessed at the end of the intervention period, which spanned two weeks.

Administration of the intervention: The respondents from both the control and study groups were invited to participate in the study. Prior to the intervention, both groups underwent a pre-test to assess their perceived quality of life. The intervention was then administered to the study group, which included providing them with posters and handbills on lifestyle modification as reminders for the training and recommended practices. Follow-up visitations and phone calls were conducted to maintain contact with the respondents and ensure their compliance with the advice provided. This follow-up process continued for a duration of sixteen weeks. The same instrument used for the pre-test was administered as a post-test to both the study and control groups after four months of the intervention to determine whether any

significant effect had occurred as a result of the intervention. The data collection period lasted a total of twenty-two (22) weeks. The study involved six trained research assistants who assisted in data collection and management. It is worth noting that the control group received the intervention after the data collection phase.

Method of Data Analysis: The collected data was collated and analysed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistical measures such as frequency, percentages, mean, and standard deviation were employed to analyse the data. The results were presented in the form of frequency tables, providing a clear overview of the data distribution. To test the hypotheses regarding quality-of-life variables, a paired t-test was conducted with a significance level set at 0.05. This statistical test allowed for the comparison of pre-test and post-test data

within each group, assessing the potential impact of the intervention on the participants' quality of life.

The Evaluation response scale: This section pertains to the evaluation of a state, capacity, or behaviour, with the underlying assumption that a more positive appraisal corresponds to an increase in the respondent's quality of life. To ensure consistency across WHOQOL field centres, a standardized methodology was employed, outlining anchor points for each of the four types of 5-point response scales (Evaluation, Intensity, Capacity, and Frequency), as well as a scale metric to guide the selection of intermediate descriptors. Specifically, descriptors were derived to represent words or terms positioned at the 25%, 50%, and 75% points between the two anchor points, ensuring appropriate placement along the response scales (Szabo et al., 1997).

Table 2: Organization of Questionnaire for Analyzing the Domains of Quality of Life

DOMAINS	QUESTIONS FOR COMPUTING DOMAIN SCORES
Domain 1 Physical	Q1+Q2+Q3+ Q16.
Domain 2 Psychological	Q5 + Q6 + Q7 + Q11 + Q19 + Q26
Domain 3 Level of Independence	Q4 + Q10 + 15 + Q17 + Q18
Domain 4 Social relations	Q20 + Q21 + Q22
Domain 5 Environment	Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25

(Source: Szabo *et al.*, 1997))

Table 3: Distribution of demographic variables of respondents

Variables	Study group		Control group	
	Freq.	n= 45 %	Freq.	n = 45 %
Age (years)				
<30	3	6.7	3	6.7
30-39	2	4.4	3	6.7
40-49	12	26.7	22	48.9
50-59	16	35.6	9	20.0
>59	12	26.7	8	17.8
Sex				
Male	9	20	4	8.9
Female	36	80	41	91.1
Occupation				
Civil Servant	9	20.0	2	4.4
Farmer	2	4.4	1	2.2
Self-employed	24	53.3	29	64.4
Unemployed	10	22.2	13	28.9
Educational level				
No formal education	7	15.5	5	11
Primary	12	26.5	10	22
Secondary	20	44	22	48.9
Tertiary	6	13	8	17.8

Table 4 presents the distribution of respondents' diabetes duration and treatment methods in both the study and control groups. The results indicate that 12 individuals (26.7%) in the study group and 13 individuals (28.9%) in the control group had been diagnosed with diabetes for less than a year before the commencement of the study. Additionally, 11 individuals (24.4%) in the study group and 13 individuals (28.9%) in the control group had been living with diabetes for over 10 years prior to the study. In terms of treatment methods, the

table shows that 21 individuals (46.7%) in the study group and 14 individuals (31.1%) in the control group were solely on a diet as a treatment for their diabetes before the study. Furthermore, 19 individuals (42.2%) in the study group and 23 individuals (51.1%) in the control group were on oral drugs and diets as their treatment method. Respondents receiving injections along with a diet were 5 individuals (11.1%) in the study group and 8 individuals (17.8%) in the control group.

Table 4: Distribution of respondent’s medical history according to study group

Variables	Study group	n=45	Control group	n= 45
	Freq.	%	Freq.	%
Period of diagnosis (years)				
<1	12	26.7	13	28.9
1-3	4	8.9	3	6.7
4-6	9	20.0	7	15.6
7-9	9	20.0	9	20.0
>10	11	24.4	13	28.9
Type of treatment taken				
Diet only	21	46.7	14	31.1
Drugs only	0	0.0	0	0.0
Oral drugs and Diets	19	42.2	23	51.1
Injection and Diets	5	11.1	8	17.8

Research question one:

What is the perceived quality of life of diabetic patients before intervention?

The perceived quality of life of diabetic patients before the intervention was assessed by computing and comparing the mean scores

of the study group and control group. The quality of life was measured on a five-point scale, with scores categorized as follows: ≥ 3.50 (70% and above) indicating good quality of life, 2.5-3.49 (50-60%) indicating poor quality of life, and < 2.49 (49.8% and below) indicating very poor quality of life.

Table 5 presents the frequency and percentages of responses from both the study group and control group towards their perceived quality of life according to its domains. The table indicates that 14% of both the study group and control group had a positive perception about their quality of life. Additionally, 43.6% of the study group and 40.8% of the control group had

a fair perception of their quality of life. Lastly, 42.4% of the study group and 45.62% of the control group had a poor perception of their quality of life. Based on these findings, it can be concluded that both the study and control groups had a fair perception of their quality of life before the intervention, as a significant percentage fell within the fair perception category.

Table 5: Perceived Quality of Life Domains, Before Intervention

Quality of Life Domains	Study group n= 45			Control group n=45		
	Positive Freq.%	Fair Freq.%	Poor Freq.%	Positive Freq.%	Fair Freq.%	Poor Freq.%
Domain 1 physical	8(18)	16(36)	21(46)	9(19)	17(38)	19(43)
Domain 2 Psychological	5(11)	23(52)	17(37)	6(14)	17(38)	22(48)
Domain 3 Level of independence	21(21)	20(45)	15(34)	7(17)	21(46)	17(37)
Domain 4 Social relations	5(13)	18(39)	22(48)	8(18)	17(37)	20(45)
Domain 5 environment	2(6)	21(46)	22(48)	3(8)	20(45)	22(48)
Aggregate %	14	43.6	42.4	14	40.8	45.2

Table 6 above showed aggregate mean score according to the five domains of quality of life as perceived by study groups. In both cases the mean score is 3.27 for the study group and 3.29 for the control group which is below 3.5 but above 2.49 meaning that before the

intervention, the respondents perceived their quality of life as being fair. The aggregate p-value of 0.8900 revealed that there is no significant difference in their responses before intervention.

Table 6: Mean score on quality of life, before intervention.

QOL. Domains	Study group n=45		Control GROUP n=45		t	p-value
	Mean	SD	Mean	SD		
Domain 1: Physical	3.18	1.060	3.20	1.043	-0.0902	0.928
Domain 2: Psychological	3.18	0.933	3.20	0.917	-0.1026	0.9186
Domain 3: Level of Independence	3.22	0.974	3.30	0.942	-0.3961	0.693
Domain 4: Social relations	3.40	1.037	3.38	1.037	0.0915	0.9274
Domain 5: Environment	33.9	0.971	3.41	0.845	-0.0521	0.9586
Aggregate mean	3.27	1.00	3.29	0.96	-0.11	0.8900

Research question two:

What is the effect of Lifestyle Modification Education on the study group' Perception of their Quality of Life?

The effect of lifestyle modification education on the study group's perception of their quality of life was assessed by comparing their pre-intervention and post-intervention scores. Table 7 presents the frequencies, percentages, and mean scores of the study group before the intervention. Before the intervention, 14% of the study group had a positive perception, 43.6% had a fair perception, and 42.4% had a

poor perception of their quality of life.

After the intervention, there was a significant increase in the aggregate percentage of responses indicating a positive perception of quality of life, which rose from 14% before the intervention to 61% after the intervention. This suggests that lifestyle modification education had a positive effect on the respondents' perception of their quality of life. The study indicates that the level of perception of quality of life improved from fair (14%) before the intervention to good (60.6%) after the intervention.

Table 7: Perception on Quality of Life of Study Group before and after Intervention N = 45

Quality of Life Domains	Before intervention			After intervention		
	Positive QOL. Freq.%	Fair QOL Freq.%	Poor QOL Freq.%	Positive QOL. Freq %	Fair QOL Freq.%	Poor QOL Freq %
Domain 1 physical	8(18)	16(36)	21(46)	27(60)	12(27)	6(13)
Domain 2 Psychological	5(11)	23(52)	17(37)	26(58)	13(28)	6(14)
Domain 3 Level of independence	21(21)	20(45)	15(34)	31(69)	12(27)	2(4)
Domain 4 Social relations	5(13)	18(39)	22(48)	25(58)	18(38)	2(5)
Domain 5 environment	2(6)	21(46)	22(48)	27(60)	16(35)	2(5)
Aggregate %	14	43.6	42.4	60.6	31.2	8.2

Table 8 presents the observed values and p-values for the five domains of quality of life before and after the intervention. The results indicate that there were no significant differences in responses for domains 1, 3, and 5, while differences were observed in responses for domains 2 and 4. The aggregate mean score showed an increase from 3.27 before the intervention to 3.68 after the intervention, suggesting that lifestyle modification had an

effect on the perceived quality of life of the respondents. This study suggests that there is a significant effect in the aggregate mean score according to the five domains of lifestyle modification education on the study and control groups' perception of their quality of life after the intervention (p=0.0794). This effect could be attributed to the fact that the respondents had some level of perception of their quality of life before the intervention.

Table 8: Mean score of domains of quality of life, before and after intervention.

Quality of life Domain	Before intervention		After intervention		t	p-value
	Mean	SD	Mean	SD		
Domain 1 Physical	3.18	1.060	3.63	1.038	-2.035	0.045
Domain 2 psychological	3.18	0.932	3.45	0.912	-1.3889	0.1684
Domain 3 Level of independence	3.22	0.974	3.68	0.952	-2.679	0.0258
Domain 4 Social relations	3.30	1.037	3.77	0.970	-2.7479	0.084
Domain 5 Environment	3.39	0.971	3.48	0.841	-1.5262	0.048
Aggregate	3.27		3.68		1.9931	0.0794

Hypothesis

There is a significant difference in the perceived quality of life before and after the intervention. The scores of the study group were compared before and after the intervention with lifestyle modification education to assess the effect on their perception of quality of life. The results of the t-test used for the hypothesis are summarized in Table 9.

The findings demonstrate that the study group's perception of their quality of life significantly increased after the intervention with lifestyle modification education. This indicates that the

study group, who received the lifestyle modification education, experienced a significant improvement in their perceived quality of life compared to their perception before the intervention. The t-value observed for the test was 3.685, and the p-value was 0.001 ($P < 0.05$). Therefore, the null hypothesis stating that there is no significant difference in the quality of life before and after the intervention is rejected. The results reveal that exposure to lifestyle modification education has a significant effect on the perception of their quality of life.

Table 9: Effect of Lifestyle Modification Education on Quality of Life Before and After Intervention.

Variables	Mean	Std. Dev.	t-value	p-value
Before intervention	3.27	0.590	3.685	.001
Post intervention	3.68	0.374		

DISCUSSION

This study assessed the effect of lifestyle modification education on quality of life among patients with type 2 diabetes in Samaru Community, Sabon-Gari, Local Government Area, Kaduna state. Socio-demographic characteristics of the respondents were assessed, and the result revealed that both control and study group have equal number of respondents below 30years which is few numbers. The result further showed that majority of the respondents were within 40 to 49years age bracket, while moderate number of the respondents were within the 50 to 59years age bracket. The result also revealed that almost three quarter of the respondents were above 40 years of age.

Furthermore, the study showed a variation in relation to gender, where females were higher in the study than the males. This distribution ensures gender representation in the study. This result is not in agreement with *Sayeed et al, (2020)* who reported that diabetes mellitus is higher in men than in women in rural areas of Africa, Nigeria inclusive. This result agrees with *Agbakhani et, al (2016)* which revealed that pull of 136 patients that participated in

their study, Men were lower in number and women being higher. The variability may be due to difference in geographical area.

The study also found that the majority of respondents were employed, indicating that they had a source of income and were engaged in daily activities. This employment status fulfills the psychological domain of self-esteem in the quality-of-life theory. It also signifies the fulfillment of the third domain, work capacity, and less dependence on others for financial support. Having financial resources promotes the fourth domain, social relationships, and contributes to the improvement of an individual's home environment, which corresponds to the fifth domain.

The result further revealed that all the respondents had some form of education, with a higher number having secondary education. This indicates that the respondents were literate, with the majority having formal education and a small percentage having no formal education. This literacy demonstrates the characteristics of the second quality-of-life domain, which includes thinking, learning, memory, and concentration.

The study also assessed the perception of quality of life before and after the intervention, focusing on the five domains: Physical, Psychological, Level of Independence, Social Relations, and Environment. The overall scores indicated that both the study and control groups had a fair perception of their quality of life before the intervention. However, after the intervention, there was a significant increase in the percentage of positive perception of quality of life. This finding aligns with a study by Susy (2021) on quality of life among patients with type 2 diabetes, which reported poor quality of life in the physical and psychological domains but good quality of life in the social domain.

The result of the study further revealed an increase in aggregate percentage of responses for positive perception of quality of life from 14% before intervention to 60.6% after intervention. The study agrees with report of study by Susy (2021) on quality of Life among Patients with Type 2 Diabetic Mellitus in Out Patient Department, General Public Hospital, which reported that majority of participants (64.4) had a poor quality of Life in the physical domain, and above half had poor quality of Life in the psychological and environmental domains. Conversely, the social domain showed good quality of Life in the in more than 64% of patients with type 2 DM.

Furthermore, the study found that the aggregate mean score increased from 3.27 before the intervention to 3.68 after the intervention. These findings suggest a significant effect in the aggregate mean score across the five domains of lifestyle modification education on the perception of quality of life for both the study and control groups after the intervention ($P=0.0794$). A hypothesis test conducted to determine the effect of lifestyle modification education on the perception of quality of life showed a t-value of 3.685 and a p-value of 0.001 ($P < 0.05$). This indicates that exposure to lifestyle modification education had a significant effect on the study group's perception of their quality of life. These findings align with a study by Suraj and Elwagie (2020) on the impact of

diabetes education on the health status of diabetes patients, which reported an increase in scores across the six dimensions of quality of life in the case group after the intervention. They also support the findings of Baghianimoghadam, Afkhami, & Baghianimoghadam (2009), who observed an increase in scores across the six dimensions of quality of life among type 2 diabetic patients after an educational intervention at a diabetes research center in Yazd, Iran.

CONCLUSION AND RECOMMENDATIONS

Based on the study results and limitations, the following conclusions were drawn: Initially, the level of respondents knowledge was moderate, which improved to high level of knowledge after the intervention. Lifestyle modification education was found to have a positive effect on the quality of life of patients with type 2 diabetes, as evidenced by an increase in their perception of quality of life after the intervention. Based on these findings, it is recommended that nurses receive encouragement from the Head of nursing services in their respective healthcare units to utilize lifestyle modification education as a non-pharmacological approach for enhancing the quality of life of diabetic patients.

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