Diabetic Patients: Health Education Through Physical-Interaction and Practice of Self-Care in A State Hospital in Oyo State, Nigeria

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Abstract

The study examined the effect of physical interaction intervention on self-care practices among diabetic patients in a state hospital in Oyo State. The study investigated the baseline level, post- intervention level and 6th week follow-up of self-care practices among diabetic patients exposed to physical-interaction intervention. The study utilized a quasi-experimental design comprising of only an experimental group on physical interaction. Thirty diabetic patients were selected through a multi-staged sampling procedure from Adeoyo state hospital in Oyo State. A validated instrument was used to elicit information on self- care practices at baseline, immediate-post intervention and follow-up. A training manual was developed to facilitate the intervention. The education intervention was administered to the group through a 60 minutes session for 6 weeks. Data were subjected to both descriptive and inferential statistical analysis with significant level set at 0.05. The findings of the study revealed that patients' self-care sub domain variables were low in the baseline. However, foot care behavior was high. The study also revealed that at the immediate post-intervention, the respondents' physical activities had a mean of 9.77 with SD of 3.36; healthy eating 9.80 with SD of 3.08; monitoring blood glucose activities 11.57 with SD of 3.97; compliance with medication activities 12.86 with SD of 4.45; risk reduction 12.50 with SD of 4.70; and foot care 12.70 with SD of 4.47. At 6th week follow-up, the respondents' physical activities had a mean of 11.43 with SD of 0.90; healthy eating 11.00 with SD of 1.41; monitoring blood glucose activities 13.63 with SD of 0.85; compliance with medication activities 14.00 with SD of 1.31; risk reduction 14.30 with SD of 4.70; and foot care 14.10 with SD of 0.99. It was recommended among

others that health workers should as a matter of urgency introduce health classes to diabetic patients at least once a week to foster good adherence to self-care activities.

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INTRODUCTION

Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. It is among the top ten (10) causes of death in adults, and has been estimated to have caused four million deaths globally in 2017 (The International Diabetes Federation, 2017). Records have it that the prevalence of diabetes has increased in recent decades in most other developed and developing countries (Dwyer-Lindgren, et al., 2016, Wang, et al, 2017; Patterson, et al, 2019).

The International Diabetes Federation (IDF) estimated in 2017 that worldwide, 451 million adults live with diabetes with a predictable escalation to 693 million by the year 2045 if no effective prevention methods are adopted and implemented (Cho, et al., 2018). Diabetes may be type I diabetes (T1D), type II diabetes mellitus (T2D) or gestational diabetes mellitus (GDM) (Saeedi et al., 2020). Type I diabetes, formerly known as insulin dependent, juvenile or childhood-onset diabetes, is characterized by the inability of the pancreas to produce sufficient insulin. According to the WHO (2020), the cause or prevention of this type of diabetes remains unknown. On the other hand, type II diabetes (formerly known as non-insulin dependent or adult-onset diabetes), which is the focus of this study, is characterized either by the body not producing enough insulin, or it resists insulin. This type of diabetes, which largely has excess body weight and physical inactivity as risk factors, is now also occurring frequently in children (WHO, 2020). Diabetes is thus characterised by the body's inability to regulate the amount of sugar in the body. When uncontrolled, diabetes results in a condition known as raised blood sugar (hyperglycaemia) which damages different parts of the body system, especially the nerves and blood vessels.

Nigeria is one of the 48 countries of the International Diabetes Federation African region. Four hundred and sixty three million (463,000,000) people have diabetes in the world and more than 19 million people in the African Region (IDF, 2019). In Nigeria, the current prevalence of Diabetes among adults aged 20–69 years have been reported to be on the rise over the years and in the year 2017, prevalence of Diabetes was reported to be 1.7% (IDF, 2017) and now 3% in the year 2020 (IDF, 2020).

Various researchers have reported several prevalence rate ranging from 2% to 12% across the country (Sabir, et al. 2011, Gezawa, et al., 2015, Uloko, et al, 2018;). As already pointed out, the sixth edition of IDF diabetes Atlas indicated that Nigeria is the leading country in Africa in terms of the number of people with diabetes, 3.9 million had diabetes with 105,091 diabetes-related deaths in 2013 which is estimated to increase annually by 125,000 between 2010 and 2030 (IDF, 2013). Following the upsurge in the prevalence of Diabetes in Nigeria, it is evident that a method should be put in place to curb the menace of the disease.

Health educational interventions can improve health literacy and consequent self-care activities among individuals with diseases. Frequent verbal health educational interventions can enhance patients engagement, participation as well as promote medication literacy (Ampofo, et al., 2020). Educational strategies have been found as a popular and effective intervention in improving self-care behaviors among people with diabetes (Williams, et al., 2014). Diabetes education programs increased participant's awareness and understanding of the disease and strengthened motivation and self-care (Ahmed, et al. 2015). In addition, the study highlighted educational intervention as an important role in preventing acute complications, reducing the risk of long-term complications and consequently reducing the economic costs of diabetes treatment by preventing complications.

In view of the above, the study examined the effect of physical interaction intervention on self-care practices among diabetic patients in a state hospital in Oyo State.Specifically, the study examined:

1. the baseline level of self-care practices among diabetic patients exposed to physical-interaction intervention;
2. the level of physical-interaction intervention on the practices of self-care among diabetic patients; and
3. the self-care practices among diabetic patients exposed to physical-interaction intervention at 6th week follow-up.

Research Questions

The following research questions were raised for this study;

1. What is the baseline level of self-care practices among diabetic patients exposed to physical-interaction intervention in a state hospital in Oyo State?
2. What is the level of physical-interaction intervention on the practices of self-care among diabetic patients in a state hospital in Oyo State?
3. What are the self-care practices among diabetic patients exposed to physical-interaction intervention at 6th week follow-up in a state hospital in Oyo State?

Methodology

The study utilized a quasi-experimental design comprising of only an experimental group on physical interaction. Thirty diabetic patients were selected through a multi-staged sampling procedure from Adeoyo state hospital in Oyo State. A validated instrument was used to elicit information on self- care practices at baseline, immediate-post intervention and follow-up. A training manual was developed to facilitate the intervention. The education intervention was administered to the group through a 60 minutes session for 6 weeks. Furthermore, at the end of the intervention, and subsequently the follow-up evaluation was conducted using the same instrument used at baseline. Data were subjected to both descriptive and inferential statistical analysis with significant level set at 0.05.

Results

Research Question 1: What is the baseline level of self-care practices among diabetic patients exposed to physical-interaction intervention in a state hospital in Oyo State?

Table 1: Baseline level of self-care practices among diabetic patients exposed to telephone-messages intervention

Self-Care Behavior	Physical-interaction intervention F (%)
Physical Activities Measured on a 12-point Rating Scale	
Low (0-6)	26 (86.7)
High (7-12)	4 (13.3)
Mean ±SD	**4.60±1.54**
Healthy Eating Measured on a12-point Rating Scale	
Low (0-6)	23 (76.7)
High (7-12)	7 (23.3)
Mean ±SD	**4.93±1.70**
Monitoring Blood Glucose Measured on a 15 -point Rating Scale	
Low (0-7.5)	28 (93.3)

High (7.6-15)	2 (6.7)
Mean ±SD	**4.57±1.85**
Compliance With Medication Measured on a 15-point Rating Scale	
High (0-7.5)	23 (76.7)
Low (7.6-15)	7 (23.3)
Mean ±SD	**6.00±2.41**
Risk Reduction Behavior Measured on a 15-point Rating Scale	
Low (0-7.5)	16 (53.3)
High (7.6-15)	14 (46.7)
Mean ±SD	**6.97±1.99**
Foot Care Measured on a 15-point Rating Scale	
Low (0-7.5)	13(43.3)
High (7.6-15)	17 (56.7)
Mean±SD	**7.63±2.51**
Overall Self- Care Measured on an 84-point Rating Scale	
Low (0-42)	28 (93.3)
High (43-84)	2 (6.7)
Mean±SD	**34.70±4.78**

The patients' overall self-care practice was measured on an 84-point rating scale which was sectioned to assess the patients' physical activities, healthy eating, monitoring blood glucose, compliance with medication, risk reduction behavior and foot care behavior. Patients Mean ±SD score regarding physical activities, measured on a 12-point rating scale in the physical-interaction group was 4.60±1.55. Also, patient's healthy eating behavior measured on a 12-point rating scale showed a mean score of4.93±1.70. Furthermore, monitoring blood glucose by patients measured on a 15-point rating scale computed for physical-interaction group showed a Mean±SD score of 4.57±1.85. In addition, patients' compliance with medication score measured on a 15-point rating scale computed showed a Mean±SD of 6.00±2.41. Again, patients risk reduction behaviors mean score measure on a 15-point rating scale was 6.97±1.99. Furthermore, patients' foot care behavior computed on a 15-point rating scale, showed a mean score of7.63±2.51. The overall self-care behavior score measured on an84-point rating scale showed a mean score of34.70±4.78.

Patients' self-care sub domain variable proportion such as physical activities, healthy eating, monitoring blood glucose, compliance with medication and risk reduction behavior was low in the baseline. However, foot care behavior was high

Research Question 2: What is the level of physical-interaction intervention on the practices of self-care among diabetic patients in a state hospital in Oyo State?

Table 2: Level of self-care practices among diabetic patients exposed to physical interaction intervention

Variable	Maximum Points on Scale of Measure	Physical Interaction N=30
Overall Self-Care	84	
Low (0-42)		3 (10.0)
High (43-84)		27 (90.0)
Mean±SD		69.20±23.15

Physical Activities Low (0-6) High (7-12) Mean±SD	12	3 (10.0) 27 (90.0) 9.77±3.36
Healthy Eating Low (0-6) High (7-12) Mean±SD	12	4 (13.3) 26 (86.7) 9.80±3.09
Monitoring Blood Glu. Low (0-7.5) High (7.6-15.0) Mean±SD	15	3 (10.0) 27 (90.0) 11.57±3.97
Compliance Low (0-7.5) High (7.6-15) Mean±SD	15	3 (10.0) 27 (90.0) 12.87±4.46
Risk Reduction Low (0-7.5) High(7.6-15) Mean±SD	15	4 (13.3) 26 (86.7) 12.50±4.70
Foot Care Low (0-7.5) High(7.6-15) Mean±SD	15	3 (10.0) 27 (90.0) 12.00±4.47

The respondent's' self-care of diabetics was measured using different typologies of self-care at the immediate post-intervention such as physical activities, healthy eating, monitoring blood glucose, compliance with medication, risk reduction and foot care. The overall self-care behavior measured on an 84- point rating scale revealed the mean and standard deviation (SD) were 69.20 and 23.14 respectively.

The respondents' physical activities had a mean of 9.77 with SD of 3.36; healthy eating 9.80 with SD of 3.08; monitoring blood glucose activities 11.57 with SD of 3.97; compliance with medication activities 12.86 with SD of 4.45; risk reduction 12.50 with SD of 4.70; and foot care 12.70 with SD of 4.47.

Table 3: Impact Evaluation for Respondents' Self-Care Practice

Variables	Maximum Points on Scale of Measure	Baseline N=30		Post Intervention N=30		*ES (95%CI)	p-value
		$\bar{x}$(SE)±SD		$\bar{x}$(SE)±SD			
Overall Self-Care	84	34.70 (0.87)	4.78	69.20 (4.23)	23.14	-2.100 (-6.26 to 2.06)	0.00
Physical Activities	12	4.60 (0.28)	1.54	9.77 (0.61)	3.36	-2.010 (-2.67 to 1.36)	0.00
Healthy Eating	12	4.93	1.70	9.80	3.08	-1.985 (-2.61	0.00

		(0.31)		(0.56)		to -1.37)	
Monitoring Blood Glu.	15	4.57 (0.34)	1.85	11.57 (0.73)	3.97	-2.298 (-3.07 to -1.53)	0.00
Compliance	15	6.00 (0.44)	2.41	12.87 (0.81)	4.45	-1.951 (-2.84 to -1.06)	0.00
Risk Reduction	15	6.97 (0.36)	1.90	12.50 (0.85)	4.70	-1.560(-2.46 to -0.67)	0.00
Foot-Care	15	7.63 (0.46)	2.29	12.70 (0.81)	4.47	-1.422 (-2.32 to -0.52)	0.00

Table 3 revealed that there was a statistically significant difference in the mean scores and the effect size computed indicating the magnitude of the differences in means between baseline and immediate post intervention was significant. The overall effect size was -2.100 with p-value of 0.000.

Research Question 3: What are the self-care practices among diabetic patients exposed to physical interaction intervention at 6th week follow-up in a state hospital in Oyo State?

Table 4: Self-care practices among diabetic patients exposed to physical interaction intervention at the 6th week follow-up

Variable	Maximum Points on Scale of Measure	Intervention One N=30
Overall Self-Care Low (0-42) High (43-84) Mean±SD	84	0 (0.00) 30 (100.0) 78.47±4.20
Physical Activities Low (0-6) High (7-12) Mean±SD	12	0 (0.00) 30 (100.0) 11.43±0.90
Healthy Eating Low (0-6) High (7-12) Mean±SD	12	0 (0.0) 30 (100.0) 11.00±1.41
Monitoring Blood Glu. Low (0-7.5) High (7.6-15.0) Mean±SD	15	0 (100.0) 30 (100.0) 13.63±0.85
Compliance Low (0-7.5) High (7.6-15) Mean±SD	15	0 (0.00) 30 (1000.0) 14.00±1.31
Risk Reduction Low (0-7.5) High (7.6-15) Mean±SD	15	(0.00) 30(100.0) 14.30±1.15

Foot Care	15		
Low (0-7.5)		0(0.00)	
High (7.6-15)		30 (100.0)	
Mean±SD		14.10±0.99	

The respondent's' self-care of diabetics was measured using different typologies of self-care such as physical activities, healthy eating, monitoring blood glucose, compliance with medication, risk reduction and foot care at 6th week follow-up. The overall self-care behavior measured on an 84- point rating scale revealed the mean and standard deviation (SD) were 78.47 and 4.20 respectively.

The respondents' physical activities had a mean of 11.43 with SD of 0.90; healthy eating 11.00 with SD of 1.41; monitoring blood glucose activities 13.63 with SD of 0.85; compliance with medication activities 14.00 with SD of 1.31; risk reduction 14.30 with SD of 4.70; and foot care 14.10 with SD of 0.99.

Table 5: Impact Evaluation for Respondents' Self-Care Practice at the 6th week follow-up

Variables	Maximum Points on Scale of Measure	Baseline N=30		Follow-Up N=30		*ES (95%CI)	p-value
		$\overline{x}$(SE)±SD		$\overline{x}$(SE)±SD			
Overall Self-Care	84	34.70 (0.87)	4.78	78.47 (0.77)	4.20	-9.895 (-11.01 to -8.78)	0.00
Physical Activities	12	4.60 (0.28)	1.54	11.43 (0.16)	0.90	-5.501 (-5.82 to -5.19)	0.00
Healthy Eating	12	4.93 (0.31)	1.70	11.00 (0.26)	1.41	-3.945 (-4.33 to -3.56)	0.00
Monitoring Blood Glu.	15	4.57 (0.34)	1.85	13.63 (1.55)	0.85	-6.401 (-6.76 to -6.04)	0.00
Compliance	15	6.00 (0.44)	2.41	14.00 (0.24)	1.31	-4.197 (-4.68 to -3.72)	0.00
Risk Reduction	15	6.97 (0.36)	1.99	14.30 (0.21)	1.15	-4.588(-4.99 to -4.18)	0.00
Foot-Care	15	7.63 (0.46)	2.51	14.10 (0.18)	0.99	-3.443 (-3.92 to -2.)	0.00

***ES: effect size of the intervention computed from Cohen's d**

Table 5 revealed that there was a statistically significant difference in the mean scores and the effect size computed indicating the magnitude of the differences in means between baseline and 6th week follow-up was significant. The overall effect size was -9.895 with p-value of 0.000.

The interaction plot in the physical interaction showed that the respondents' self-care practice increased across time. There was a significant increase in the self-care practices between the baseline and immediate post-intervention time. The increase in mean score was sustained at the follow-up period (Figure 1)
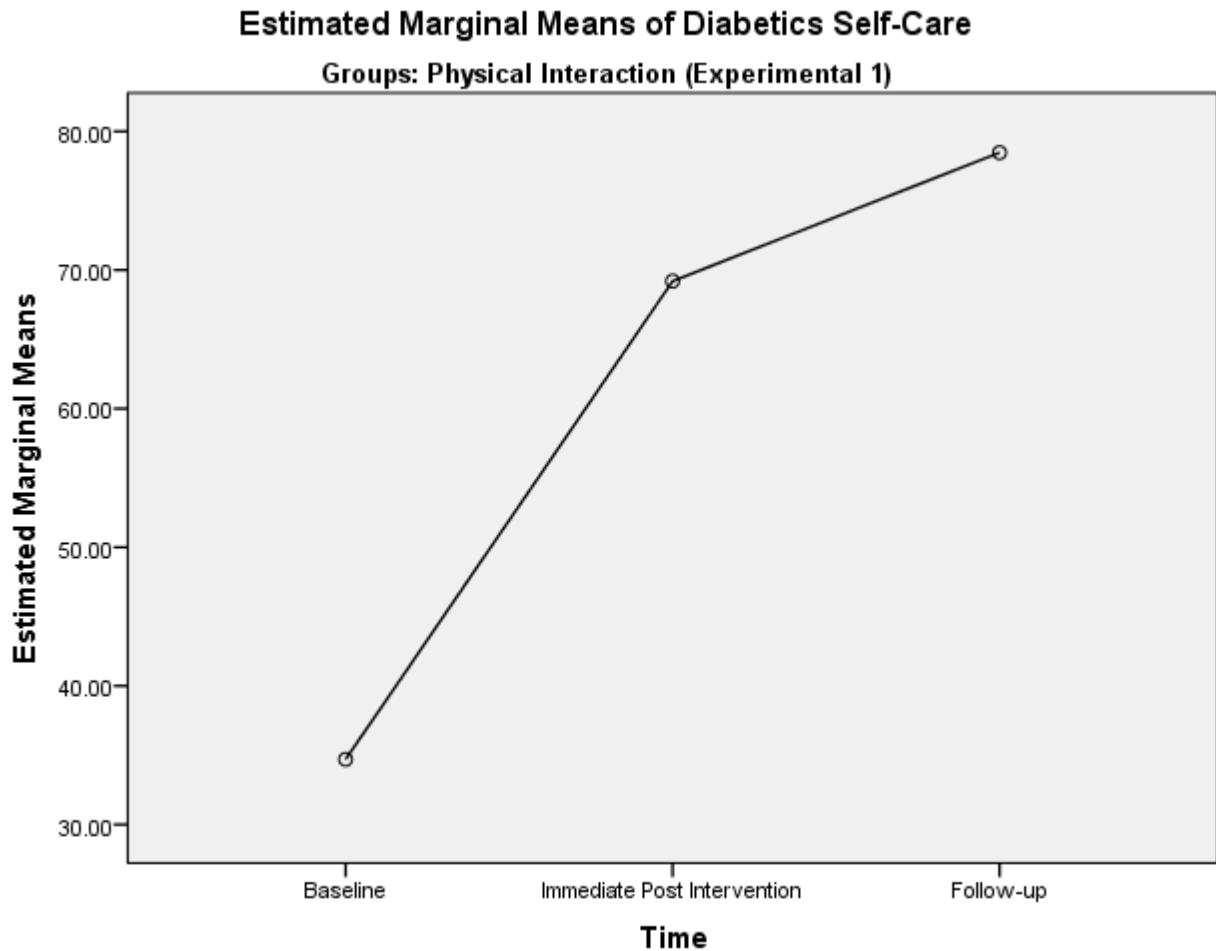
Estimated Marginal Means of Diabetics Self-Care
Groups: Physical Interaction (Experimental 1)

Figure 1: Plot Showing the Change in the Respondents' Self-Care Practices across the Timeline

Discussion

The findings of the study revealed that patients' self-care sub domain variable proportion such as physical activities, healthy eating, monitoring blood glucose, compliance with medication and risk reduction behavior was low in the baseline. However, foot care behavior was high. The study also revealed that at the immediate post-intervention, the respondents' physical activities had a mean of 9.77 with SD of 3.36; healthy eating 9.80 with SD of 3.08; monitoring blood glucose activities 11.57 with SD of 3.97; compliance with medication activities 12.86 with SD of 4.45; risk reduction 12.50 with SD of 4.70; and foot care 12.70 with SD of 4.47. There was a statistically significant difference in the mean scores and the effect size computed indicating the magnitude of the differences in means between baseline and immediate post intervention was significant. The studies of Sarani (2011) and Jedgal et al. (2014) indicated the effect of physical interaction on promoting preventive behaviors and adhering to treatment or the construct of the pattern. Hisam, et al (2020) revealed that physical interaction increased the patients' self-care diabetic practice and decreased the rate of diabetic foot ulcer and admission for treatment of foot ulcer. This finding is also consistence with the study done by Hemmati, et al (2017) who reported higher

self-care scores, in the total score, mean dietary adherence score, and physical activity score as well as in lipid profiles in the physical interaction group.

The study further revealed that at 6th week follow-up, the respondents' physical activities had a mean of 11.43 with SD of 0.90; healthy eating 11.00 with SD of 1.41; monitoring blood glucose activities 13.63 with SD of 0.85; compliance with medication activities 14.00 with SD of 1.31; risk reduction 14.30 with SD of 4.70; and foot care 14.10 with SD of 0.99. There was a statistically significant difference in the mean scores and the effect size computed indicating the magnitude of the differences in means between baseline and 6th week follow-up was significant.

Conclusion

The study concluded that physical interaction with diabetics patients, impacts the levels of self-care practices which are very important in achieving and sustaining optimal HBA1c and blood glucose levels among patients with T2DM positively. This was demonstrated at the immediate post-intervention and at the 6th week follow-up.

Recommendations

Based on the findings of this study, the following are recommended:

1. Health workers should as a matter of urgency introduce health classes to diabetic patients at least once a week to foster good adherence to self-care activities
2. Media houses should also run health programs on their station to inform or educate viewers on some of the health challenges.

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