



Knowledge of Self-Care Management and Diabetic Control among Patients with Diabetes Mellitus Type 2 in Randle General Hospital, Lagos State

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ABSTRACT: Diabetes mellitus is a chronic disease which affects the metabolism of glucose in the body resulting in increased morbidity and mortality rates. This study assessed knowledge and practice of self-care management and diabetic control among patients with type 2 diabetes mellitus in Randle General Hospital in Lagos State. The study adopted a descriptive research design and involved a population of patients with diabetes mellitus type 2 attending the out-patient department of Randle General Hospital. The Taro Yamane formula was used to determine the sample size while a convenience sampling technique was applied in the selection of participants. The instrument for data collection was a self-designed structured questionnaire which facilitated eliciting information from the participants. One hundred and twenty copies of questionnaire were administered and retrieved. Data obtained were analyzed using Statistical Package of Social Sciences (SPSS) version 21. Analysis used descriptive statistical method to answer the research questions while inferential statistics of Pearson's correlation was used to test the hypotheses.

Results showed that all the respondents (100%) had good knowledge of self-care management of type 2 diabetes mellitus, majority of them (97.5%) practiced self-care management very well and 95.8% agreed that self-care management helped them to control diabetes mellitus type 2. A significant relationship exists between knowledge and practice of self-care management of diabetes mellitus as well as the practice of self-care management and control of diabetes mellitus.

The study concluded that increased knowledge and practice of self-care management help in the control of diabetes mellitus, therefore, it is recommended that further health education programs on self-care management of diabetes should be organized.

Keywords: Diabetic control, Diabetes mellitus, Knowledge, Practice of self-care management, Randle General Hospital.

I. INTRODUCTION

Diabetes mellitus is a set of metabolic diseases categorized by increased level of glucose in the blood which is identified as hyperglycemia. The rise in level of glucose in the blood is the effect of deficiency in insulin secretion or unproductive reaction of the cells to insulin secreted in the body or both (Hinkle & Cheever, 2014). Diabetes mellitus is a chronic disease acquired through lifestyle. This disease condition is associated with substantial complications with morbidity and mortality. Complications of diabetes mellitus can be prevented or delayed through adequate care and control of the disease. Al Nuaimi, Yousif and Al Chetachi (2013) argued that the process of controlling and preventing complications arising from diabetes mellitus is associated with increased workload to the individual. The identified

workload arises from the long-term demands on the patient for sustained self-care management and preventative care practice.

World Health Organization (WHO) (2018) acknowledged two main types of diabetes mellitus which are Type 1 Diabetes mellitus similarly identified as Insulin-Dependent or Juvenile diabetes mellitus. Diabetes mellitus Type-1 is associated with failure of the pancreas to secrete insulin which is an essential hormone for human survival. Diabetes mellitus Type 1 commonly develops in children and adolescents therefore, it is often called Juvenile Diabetes mellitus. Diabetes mellitus Type 2, similarly known as Non-Insulin Dependent Diabetes Mellitus (NIDDM) is a consequence of the body's failure to respond accurately to the action of insulin produced by the pancreas. This type of diabetes occurs more frequently than diabetes type 1 and is responsible for approximately 90% of all the cases of diabetes globally. Diabetes type 2 is more common in adults and it is not reliant on administration of insulin but can be controlled by lifestyle modification (WHO, 2018).

Kueh, Morris and Juan (2015) argue that lack of knowledge and poor attitude towards diabetes mellitus and its management is responsible for high prevalence and increasing trends of diabetes mellitus type 2. The American Diabetes Association [ADA] (2015) recommends assessment of self-care management skills annually as well as provision of continuous diabetes education to prevent long-term complications. The aim of this is to gain from optimum glycemic control which is important to the well-being of people living with this disease condition. In another study, Ahmed, Seriwala and Anis (2015) point to the educational level of patients as factors associated with general knowledge and higher socioeconomic status. This is believed to confer the ability to obtain information from the mass media, books and the internet on chronic health conditions like diabetes mellitus. Patients with such information are able to articulate their health needs with the healthcare providers. Ahmed, Seriwala and Anis (2015) contend that patients without formal education had the least knowledge of self-care management of diabetes mellitus. They inferred that the patients with accurate knowledge about diabetes mellitus type 2 could achieve better control over the disease thereby avoiding long term complications.

Self-care is commonly considered as a basic form of care for patients with chronic diseases who manage their illnesses and make daily decisions on how to take care of themselves. Baratta (2018) refers to self-care as the conscious way of paying attention to oneself in a manner to ensure that an individual cares for self but not being selfish about it. Self-care management consequently involves evaluating the physical and emotional changes the patient may need to satisfy. These changes may be due to illness, treatment and environment. In disease condition, self-care management represents recognition, and treatment of symptoms and evaluation of the treatment. Subsequently, self-care in diabetes mellitus is very important to keep the disease under control. The study by Al-Maskari, El-Sadig, Al-Kaabi, Nagelkerke and Yeatts (2013) revealed that patients who have knowledge about self-care management of diabetes mellitus achieve a long- term glycaemic control, which reduces the rate of complications associated with the disease. A study by Ahmed, Seriwala and Anis (2015) showed that positive attitude and practices such as keeping blood glucometer at home and using it to check blood glucose level and regular visits to the physician for health checks, and lifestyle adjustments support glycaemic control. The foregoing suggests that self-care has implications for the management and control of diabetes. Research shows that self-care involves four aspects consisting of self-monitoring of blood glucose, diet modification according to daily need, adjustment of insulin dosages to suite daily requirement and regular exercise (Sigurdardóttir, 2018). This suggests that factors including knowledge, physical skills, emotional characteristics and self-efficacy impact on self-care. Diabetes self-care behaviour is a significant factor which includes appropriate use of insulin, eating diabetic diet, regular exercise, and consistent use of diabetic medication in addition to recognition of hyperglycaemia, foot care and improving quality of life. Bigdeli, Nazari, Khodakarim, and Brodati (2016) assert that effective self-care helps patient to reduce total cost of morbidity and rate of mortality.

In a study evaluating knowledge and practice, self-care behaviours and quality of life of diabetic patients on dialysis, Ghannadi, Amouzegar, Amiri, Karbalaeifar, Tahmasebinejad and Kazempour-Ardebili (2016) reported significant negative correlation between patient's knowledge and practice with their glycosylated haemoglobin level and their fasting blood sugar. On the other hand, the study revealed significant positive correlation between knowledge and practice of patients with their self-care activities, showing a practical effect of patient's knowledge and practice on self-care behavior. The study highlights the importance of effective diabetes education programs in

facilitating self-care management.

Yang, Gao, Ren, Shuyu, Chen, Huang, Zhu and Pan (2017) in their study in six communities in Shanghai explored the association between knowledge, practice and achieving the combined target goal for the control of blood glucose, blood pressure and blood lipids in these communities using a 3977 participants. Findings of this study indicated a positive association between having more knowledge about diabetes and attaining the combined target goal for the control of blood glucose, blood pressure and blood lipids. This implies that increasing knowledge about diabetes mellitus would assist patients with type 2 diabetes mellitus to adhere to self-care management practices.

A study investigating practice and perception of self-management among diabetics with a sample size of 386 diabetic patients, Sabbah and Al-Shehri (2014) reported poor self-management practice compliance in the non-pharmacological aspect of the management plan which is the life style aspect of the regimen. This study therefore, identified the importance of health education in deepening patient's knowledge of managing diabetes mellitus through lifestyle and not only with medication regimen.

However, in Randle General Hospital, Surulere, Lagos State, patients were often admitted with diabetic crises. Examination of the admission register for a period of three months revealed that about 40% of patients admitted into the medical ward through the emergency and the out-patient departments were poorly managed diabetes mellitus type 2. The question one would ask is whether these patients were knowledgeable about diabetes mellitus and its management? Therefore; the aim of this study was to assess the knowledge and practice of self-care management and control of diabetes mellitus among patients in Randle General Hospital, Surulere in Lagos State. The study answered the following research questions:

1. Do patients have knowledge of diabetes mellitus type 2?
2. Do patients have knowledge of self-care management towards diabetes mellitus type 2?
3. Have patients practiced self-care management with diabetes mellitus type 2?
4. Do self-care management control diabetes mellitus type 2?

This report provided answers to the above research questions and hypotheses raised in this study.

II. METHODOLOGY

Research Design: This study employed a descriptive, cross sectional survey design to ascertain knowledge, and practice of type 2 diabetes patients on self-care management in Randle General Hospital, Lagos State.

Population: The population of study comprised of patients with diabetes mellitus type 2 in out-patient department of Randle General Hospital, Surulere Lagos State. Inclusion criteria is being diagnosed with diabetes mellitus type 2 and aged 20 years and above, being able to read and write in English language. Exclusion criteria are newly diagnosed diabetes mellitus with three months of diagnosis. Patient was excluded if they are less than 20 years of age and well managed diabetes mellitus.

Research Setting

The setting for this investigation is Randle General Hospital, Surulere Lagos State. Randle general hospital is State owned and operated hospital in Lagos State and the only general hospital in Surulere Local Government Area. Surulere LGA has a population of approximately six hundred and ninety-two thousand and five hundred (692,500) people as at year 2016 (National Population Commission of Nigeria, 2016; National Bureau of Statistics, 2016). Randle general hospital was initially commissioned on 12th September, 1964 as a health center but was later upgraded to the status of General Hospital. The hospital has two main sections which are the general section and the maternal and child section housing all the wards for surgical, medical care as well as the outpatient department.

Sample size and sampling technique

In Randle general hospital, 200 patients with diabetes come for out-patient clinic on monthly basis. Taro Yamane Formula (1967) was used to calculate the sample size for data collection.

$$n = \frac{N}{1+N(e)^2}$$

Where n = sample size

N = total population

1 = standard

e = level of precision= 0.05

$$\begin{aligned} n &= \frac{200}{1 + 200(0.05)^2} \\ &= \frac{200}{1 + 200 \times 0.0025} \\ &= \frac{200}{1.25} \\ &= 133.333 \end{aligned}$$

Therefore, sample size for this study is 133.

Sampling technique

A nonprobability sampling technique was used to select participants by convenience sampling method. In a convenience sampling technique, participants are chosen based on their availability during the research. Questionnaire was administered to patients who came for medical check-up, and who voluntarily accepted to participate in the study.

Instrumentation: A structured questionnaire consisting of five sections namely sections A, B, C, D, and E with a total of 42 close ended questions was used in data collection for the study. The questionnaire was self-structured and validated before use. Section A consists of 8 items that elicited data from the participants' socio-demographic characteristics. Section B consists of 14 items that assessed the knowledge of participants about diabetes mellitus type 2. Section C contains 6 items and assessed the knowledge of patient with type 2 diabetes mellitus on Self-care management. Section D comprises 10 items for collection of data on the participants' practice of self-care management of diabetes mellitus type 2. Section E comprises of 4 items that elicited data on effect of knowledge and practice of self-care management on the control of diabetes mellitus. All sections except section A have a "Yes" or "No" responses.

Validity and Reliability of the Instrument: The questionnaire used for data collection was developed by the researchers and reviewed by expert nurses in the education and clinical practice for face and content validity. A pretest was conducted with 13 patients at Orile Aggege General Hospital to ascertain the internal consistency and reliability of the instrument using Cronbach's alpha coefficient with a value of 0.759 which was adequate for the study.

Procedure for Data Collection: Questionnaire was administered to the participants during outpatient clinic by direct delivery on clinic days after explaining the purpose of the research to the participants and obtained written consent. One hundred and thirty three (133) copies of questionnaire were administered and 120 copies were retrieved after completion.

Procedure for Data Analysis: Data collected were organised, coded and entered into the computer for analysis using Statistical Package for Social Sciences (SPSS) version 21. The analysis was done with descriptive statistic (frequency and percentage) to provide answers to the research questions. The hypothesis was tested using Pearson's Product Moment Correlation Coefficient at a 0.05 level of significance.

Ethical Consideration

Ethical approval for this study was granted by the Babcock University Health Research Ethical Committee (BUHREC). Permission was also granted by the authority of Randle General Hospital, Surulere, Lagos State. Consent was obtained from the participants after appropriate explanation of the research and they were informed that their participation is voluntary. Confidentiality and anonymity of the participants were assured during the study. The researcher ensured that all data obtained from participants were used for the research purpose only. No conflict of interest involved in the research. Participants were assured that there will be no penalty for withdrawal from the study if they choose to

do so.

III. RESULTS

Table 1: Demographic Data of Participants

Demographic Data of Participants.		n=120	
Variables	Categories	Frequency	Percentage
Age	20-29 years	3	2.5%
	30-39 years	12	10%
	40-49 years	20	16.7%
	50-59 years	25	20.8%
	60yrs and above	60	50%
	Total	120	100
Sex	Male	32	26.7%
	Female	88	73.3%
	Total	120	100
Marital status	Single	12	10%
	Married	58	48.3%
	Divorced	10	8.3%
	Widowed	40	33.3%
	Total	120	100
Religion	Christianity	66	55%
	Islam	50	41.7%
	Traditional	4	3.3%
	Total	120	100
Occupation	Civil servants	36	30%
	Self –employed	36	30%
	Unemployed	25	20.8%
	Students	4	3.3%
	Total	120	100
Ethnicity	Igbo	38	31.7%
	Yoruba	52	43.3%
	Hausa	8	6.7%
	Others	22	18.3%
	Total	120	100
Education	No formal Education	20	16.7%
	Primary education	41	34.2%
	Secondary education	22	18.3%
	Tertiary education	32	26.7%
	Post graduate	5	4.2%
	Total	120	100
Duration of the ailment from the first diagnosis	1-5years	56	46.7%
	6-10years	35	29.2%
	11-15years	10	8.3%
	16-20years	16	13.3%
	21years and above	3	2.5%
	Total	120	100

Table 1 Present the demographic characteristics of the respondents who participated in answering the questionnaire. The data analysis shows that half of the participants were aged 60yrs and above 60(50%), while a few 3(2.5%) participants were at 20-29years.

The sex and marital status of the participants show that more than two-third 88 (73.3%) of the respondents were female and majority 58(48.3%) of them were married while 12(10%) were single respectively.

With reference to participants' religion, majority were Christians 66(55%), while 4(3.3%) were traditionalist. The occupation of participants showed that many 36 (30%) of the respondents were self-employed and civil servants

while very few were students 4(3.3%). In terms of ethnicity, majority of respondents were from the Yoruba ethnic group 52(3.3%), while minority 8(6.7%) of them were Hausa's.

The educational data revealed that about a third of the participants 41(34.2%) had first leaving certificate whereas only 5(4.2%) of them attained post graduate education. More than one-third 56(46.7%) of the participants have had diabetes mellitus for 1 to 5 years while very few 3(2.5%) of the participants have had diabetes mellitus for more than 21 years. This has implication for self-care management.

Answers to research questions

Do patients have knowledge of diabetes mellitus type 2?

Table 2: Participants Responses on knowledge of diabetes mellitus type 2

	Items	Yes	No
1	I have understanding about Diabetes Mellitus	120(100%)	
2. Sources of information	Health workers	120(100%)	
	News/Media	20(16.7%)	100(83.3%)
	Printed materials	21(17.5%)	99(82.5%)
	Family/Friends	38(31.7%)	82(68.3%)
	Religious leaders	17(14.2%)	103(85.8%)
3	Diabetes is increase level of sugar in the blood	120(100%)	
4	Diabetes has type 1 and type 2	91(75.8%)	29(24.2%)
5	Diabetes Mellitus can be transmitted from one person to the other through direct contact		120(100%)
6	Diabetes mellitus can be inherited	110(91.7%)	10(8.3%)
7	Stress can lead to diabetes mellitus type 2	8(6.7%)	112(93.3%)
8	Drinking alcohol can expose one to diabetes mellitus	98(81.7%)	22(18.3%)
9	Smoking can expose one to diabetes mellitus	99(82.5%)	21(17.5%)
10	Pregnancy can lead to development of diabetes mellitus	30(25%)	90(75%)
11	Frequent excess eating of carbohydrates can lead to diabetes	85(70.8%)	35(29.2%)
12	A person who has diabetes urinates frequently	120(100%)	
13	A person with diabetes often feels thirsty	120(100%)	
14	Diabetes mellitus can be controlled	120(100%)	

Table 2 shows participants' knowledge of diabetes mellitus type 2. The data shows that all participants, 120(100%) had good understanding of type 2 diabetes mellitus. All the participants 120(100%) their source of information about diabetes mellitus were health workers while 20(16.7%) received information about diabetes mellitus type 2 from News/media, and 21(17.5%) obtained their information from printed materials, 38(31.7%) knowledge about diabetes mellitus from family and friends, while 17(14.2%) receive diabetes mellitus information from religious leaders. All participants (120) 100% responded that diabetes is increase in the level of sugar in the blood and that it has type 1 and type 2. All the participants 120 (100%) responded that diabetes mellitus cannot be transmitted from one person to another through direct contact, however, majority 110 (91.7%) responded that diabetes can be inherited, many believed that smoking 98(82.5%), drinking alcohol 99(81.7%) can expose one to diabetes mellitus while many also believed that stress 112(93.3%), pregnancy 90(75%) cannot lead to diabetes mellitus type 2.

However, majority of the respondents agreed that persons with diabetes mellitus will experience frequent urination, increase thirst and that diabetes can be adequately controlled. The result from the data analysis shows that participants have high level of knowledge about diabetes mellitus although; no questionnaire had items on level of knowledge.

Do patients have knowledge of self-care management of diabetes mellitus type 2?

Table 3: Participants' responses on patients' Knowledge of self-care management of diabetes mellitus type 2

	Items	Yes	No
1	I have understanding about self-care management of diabetes mellitus	120(100%)	
2	Self-care management is the care one gives to himself/herself to control diabetes mellitus	120(100%)	
3	Regular monitoring of blood sugar is a self-care management in diabetes mellitus type 2	120(100%)	
4	Nutritional modification is part of self-care management	120(100%)	
5	Self-care management involves regular physical exercise	120(100%)	
6	Compliance to drug regimen is a self-care management in diabetes	120(100%)	

Table 3 reveals participants responses on knowledge of self-care management of diabetes mellitus. The data shows that all the patients 120(100%) had understanding about self-care management of diabetes mellitus and believe that it is a care one gives to himself/herself to control diabetes. Furthermore, all participants know that regular monitoring of blood sugar, nutritional modification; regular physical exercise and compliance to drug treatment are self-care management. Self-care practice of self-care is noted to be high although no items on the questionnaire elicits data on level of practice. Further research could be directed in this area to obtain data on participants' level of practice to determine if it is high or low or just adequate.

Do patients practice self-care management of diabetes mellitus type 2?

Table 4: Participants' responses on practice of self-care management of diabetes mellitus type 2

	Items	Yes	No
1	I check my blood sugar level as recommended by my health care provider	76(63.3%)	44(36.7%)
2	I adhere strictly to the dietary modification to control diabetes mellitus	116(96.7%)	4(3.3%)
3	I do regular physical exercise	117(97.5%)	3(2.5%)
4	I eat my favorite foods even though they are not good for my diabetic condition	4(3.3%)	116(96.7%)
5	I take alcohol even in diabetic condition	4(3.3%)	116(96.7%)
6	My family members and friends encourage me to practice self-care management	120(100%)	
7	I comply with my drug regimen	120(100%)	
9	I attend my appointment in the hospital	116(96.7%)	4(3.3%)

Table 4 shows the responses of the diabetic patients towards the practice of self-care management. More than half 76(63.3%) of the participants check their blood sugar level as recommended and 116(96.7%) strictly follow the dietary modification for the control of diabetes. Similarly, majority 117(97.5%) do exercise regularly. All of the patients 120(100%) practiced self-care by acting in accordance with the drug regimen, furthermore, 116(96.7%) patients attend their appointment and did not eat their favourite foods that are not good for their diabetes condition nor take alcohol in their diabetes condition. This revealed a high level of practice of self-care management which has potential to control the disease.

Does practice of self-care management help in control of diabetes mellitus type 2?

Table 5: Participants' responses to self-care practice on the Control of diabetes mellitus type 2

	Items	Yes	No
1	Practicing self-care management helps me to control my blood sugar level	120(100%)	
2	I do not feel the symptoms of diabetes mellitus when I practice self-care management	115(95.8%)	5(4.2%)
3	I practice self-care management but do not see any changes		120(100%)
4	Self-care management has helped to reduce the number of times I am admitted in the hospital because of diabetes	117(97.5%)	3(2.5%)

Table 5 shows the participants responses to self-care practice on the control of diabetes mellitus type 2. All of the participants 120(100%) answered "yes" to the item "practicing self-care management helps to control blood sugar

level. To the item: "I practice self-care management but do not see any changes" all the participants 120(100%) responded "no" meaning that they observe changes when they practice self-care management. Majority of the participants 115(95.8%) responded that they do not feel diabetes symptoms which could be interpreted as diabetes control. Another majority 115(95.8%) responded that self-care management helped to lower the number of times they were admitted to the hospital because of diabetes.

Test of hypothesis

H01: There is no significant relationship between knowledge and practice of self-care management among patients with diabetes mellitus type 2.

Table 6: Pearson Product Moment Correlation Coefficient of the relationship between knowledge and practice of self-care management among patients with diabetes mellitus type 2

		Practice	Knowledge
Practice	Pearson Correlation Sig. (2-tailed) N	1 120	.616** .000 120
Knowledge	Pearson Correlation Sig. (2-tailed) N	.616** .000 120	1 120

** Correlation is significant at 0.05 levels (2-tailed)

Table 6 above shows a positive and strong significant relationship between the knowledge of diabetic patients and the practice of self-care management ($r = .616$; $p < .05$). The hypothesis which stated that "There is no significant relationship between knowledge of self-care management and practice of self-care management" was rejected. This indicates that increase in the knowledge of self-care would invariably result in increase in level of practice of self-care management.

IV. Discussion

Discussion on patients' knowledge of diabetes mellitus type 2

The result from the data of this study shows that participants have adequate knowledge of diabetes mellitus type 2 with a range of 70% to 100% in different aspects of diabetes. This suggests that if patients appropriately apply the knowledge to self-care management, their diabetes will be controlled which could translate to prevention of complications. The findings of this study supports the findings of Yang, Gao, Ren, Shuyu, Chen, Huang, Zhu and Pan (2017) which reported positive association between more knowledge of diabetes and attaining a combined target goal of control of blood glucose, blood pressure and lipids.

Discussion on the knowledge of diabetic patients on self-care management

Findings of this study revealed that, all participants 120(100%) were knowledgeable about self-care management towards diabetes mellitus. All the participants 120(100%) agreed that it is a care one gives to himself/herself to control diabetes. All the participants are well-informed that regular monitoring of blood sugar, nutritional modification, and regular physical exercise are part of self-care. This is attributable to the participants' years of experience as diabetic patients. The result of this study is consistent with the findings of the research by Michael (2016) who describes self-care as any activity a person intentionally do to care for own mental, emotional and physical well-being. It refers to knowing what to do to take care of self and then being capable of caring for others. Likewise, Baratta (2018) discusses self-care as the sensible way of being attentive to oneself in a manner to ensure that one cares for self but without being self-centered.

Discussion on the practice of self-care management of patients with diabetes mellitus type 2

The answer to the second research question showed that majority 117(97.5%) of the patients adequately practiced self-care while very few 3(2.5%) of the participants were poor in the practice of self-care. The findings of this study support the study carried out by Sabbah and Al-Shehri (2014) on the practice of self-care management of 386 diabetic patients who participated in the study. In the study by Sabbah and Al-Sheri (2014) the practice of self-care management in compliance with medication was 94.7%, but this study has 100% compliance with medication which is very high level of practice. These two studies differ in practice of physical exercise with the result of the current study revealing 97.5% whereas in Sabbah and Al-Sherin (2014) it 41.2% of participants that practiced physical exercise. The difference between this research and Sabbah and Al-Sherin (2014) study could be a consequence of duration of the disease.

Furthermore, findings of this study partially aligns with the study by Bonger, Shiferaw and Tariku (2018) that investigated 419 patients on adherence to diabetic self-care practices and reported 401(95.7%) adherence to their medications but this study had 100 % responded that they adhered to their medications. On the contrary, the current study had 96.7% adherence to dietary recommendation while the opposite is the case with Bonger et al (2018) as 75.9% did not adhere to recommended dietary management.

Discussion on practice of self-care management and diabetes mellitus control

Findings of this study showed that majority of the participants' practiced self-care management which helped them in the control of their blood glucose level. All the participants practiced self-care and achieved diabetes control and 95.8% and 97.5% of the participants did not feel any symptoms and had reduced number of times admitted in hospital because of diabetes. These findings are in congruence with the study conducted by Jahan, Al Shibli, Mukhlif and Al Moqbali (2018) that reported 97.6% adhered to medications, 91.6% showed active lifestyle and 94% agreed that adherence to medical advice by healthcare provider can improve their glycaemic control and 75.9% of the participants agreed that maintaining blood glucose level within normal range help to prevent diabetes complications. According to Spero (2016) and Falck (2018) diabetes control is a normal blood glucose level of less than 140mg/dl (7.8mg/dl) 2 hours after meal during a random blood glucose check.

Discussion on significant relationship between diabetic patients' knowledge and practice of self-care management

The findings of this current research showed a positive significant and strong relationship between the diabetic patients knowledge and practice of self-care management ($r = .616; p=.000 < .05$). This finding aligns with the finding of Ghannadi et al (2016) which reported significant positive correlation between knowledge and practice of patients with their self-care activities, showing a practical effect of patient's knowledge and practice on self-care behavior. Moreover, result of this study supports the findings of the study by Yang, Gao, Ren, Shuyu, Chen, Huang, Zhu and Pan (2017) in six communities in Shanghai which explored the association between knowledge, practice and achieving the combined target goal for the control of blood glucose, blood pressure and blood lipids in these communities using a 3977 participants. This suggests that the more the patients have knowledge regarding the disease and self-care methods, the more likely they will take up self-care management and practice health promoting behaviors.

V. Conclusion

Findings show that majority of patients were knowledgeable in diabetes mellitus self-care management and 97.5% of them practiced self-care management. Findings also indicate that self-care management practice facilitates control of blood glucose level and decreases the number of admission to the hospital. The study concludes that the more knowledge patients have regarding diabetes mellitus type 2, and self-care management, the more they are likely to practice health promotion behaviour to control the disease.

VI. Recommendation

- I. We recommend that healthcare system should be made affordable and accessible.
- II. ii. Patient should be encouraged and motivated by their families and friends to sustain their self-care management of the disease condition.

- III. iii. There is the need for effective diabetes education programs in hospitals in developing countries of the world.
- IV. iv. Patients should be encouraged to participate in regular physical exercise to improve blood circulation in their extremities for optimum health.

VII. REFERENCES

1. Ahmed, M. U., Seriwala, H. M., & Anis, K. (2015). Knowledge, Attitude and Self-care Practices Amongst Patients with Type 2 Diabetes in Pakistan. *Global Journal of Health Science* <https://www.ncbi.nlm.nih.gov>
2. Al-Maskari, F., El-Sadig, M., Al-Kaabi, J. M., Afandi, B., Nagelkerke, N., & Yeatts, K. B. (2013). Knowledge, Attitude and Practices of Diabetic Patients in United Arab Emirates. www.plosone.org
3. Al Nuaimi, S. A., Yousif, E., Al Chetachi, W. F. (2013). Attitude and self-care Behaviour of Patients with Type 2 Diabetes. *Qatar Medical Journal*
4. American Diabetes Association (2015). Facts About Type 2 Diabetes. www.diabetes.org
5. Baratta M (2018) "Self care 101: 10 Ways to Take Better Care of Yourself" psychologytoday.com
6. Bigdely, M. A, Nazari, S. S. H., Khodakarim, S., Brodati, H. (2016). Factors Affecting the Self-care in Patients with Type II Diabetes Using Path Analysis. *Iranian Journals of Health Sciences*. <http://jhs.mazums.ac.ir>
7. Bonger, Z., Shiferaw, S., Tariku, E. Z. (2018). Adherence to diabetic self-care practices and its associated factors among patients with type 2 diabetes in Addis Ababa, Ethiopia. <https://www.dovepress.com>
8. Falck, S. (2018). Random Glucose Tests: Testing Stability. <https://www.healthline.com>
9. Ghannadi S, Amouzegar A, Amiri P, Karbalaeifar R, Tahmasebinejad Z & Kazempour-Ardebili S (2016). Evaluating the Effect of Knowledge, Attitude and Practice of Self-management in Type 2 Diabetes Patient on Dialysis. www.ncbi.nlm.nih.gov
10. Hinkle, J. L, & Cheever, K. H (2014). *Brunner and Suddarth's Textbook of Medical-Surgical Nursing* 13th Edition. Philadelphia: Wolter Klumer / Lippincott Williams Wilkins.
11. Jahan F, Al Shibli I, Mukhlif Z, Al Moqbali, J. (2018). Knowledge, Attitude and Barriers Towards Self-care Practices in Patients with Diabetes Mellitus in North Batinah, Sultanate of Oman. *International Journal of Public Health Research*. <https://www.openscienceonline.com/journal/ijphr>
12. Kueh Y. C, Morris T, Kuan G (2015). The Impact of Knowledge and Attitude of Self-management of People with Type II Diabetes Mellitus. <https://dx.doi.org>
13. Michael, R. (2016). What Self-care Is and What It Isn't. <https://psychcentral.com>
14. Sigurdardóttir, A. K. (2018). Self-care in diabetes: Model of factors affecting self-care. <https://www.researchgate.net>
15. Spero, D. (2016). What Is a Normal Blood Sugar Level? diabetesselfmanagement.com
16. World Health Organisation (2018) Diabetes Mellitus. www.who.int
17. Yamane, Taro (1967). *Statistics: An introductory analysis*. 2nd edition, New York: Harper and Raw.
18. Yang H, Gao J, Ren L, Shuyu L, Chen Z, Huang J, Zhu S, Pan Z (2017), "Association between Knowledge-Attitude-Practices and Control of Blood Glucose, Blood Pressure, and Blood Lipids in Patients with Type 2 Diabetes in Shanghai, China: A Cross-Sectional Study". *Journal of Diabetes Research*. Volume 2017, Article ID 3901392, 9 page, <https://doi.org/10.1155/2017/3901392>