A Study to Assess Knowledge, Attitude and Self Care Practices Regarding Type - 2 Diabetes Mellitus among the Patients (Type - 2 Dm) in Selected Hospitals of Guwahati, Assam with a View to Prepare an Information Booklet

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Abstract: **Background:** *Diabetes is a serious, long-term condition with a major impact on the lives and well being of individuals, families, and societies worldwide. Inadequate knowledge, poor attitude and poor self care practices among diabetic patients are some of the important variables influencing the progression of diabetes and its complications, which are largely preventable through education and involvement of the patient. A study was conducted on "A study to assess Knowledge, Attitude and Self Care Practices regarding Type-2 Diabetes Mellitus among the Patients (Type-2 DM) in Selected Hospitals of Guwahati, Assam with a view to prepare an Information Booklet ."* **Aim:** *The aim of the study was to assess knowledge, attitude and self care practices among patients with Type -2 Diabetes Mellitus; to find out the correlation between knowledge and attitude; knowledge and self care practices; attitude and self care practices among patients with Type-2 Diabetes Mellitus and to find out the association between knowledge, attitude and self care practices with selected demographic variables. The present study was based on Health Belief model (modified by Becker MH, 1974)* **Methodology:** *Quantitative Descriptive approach with Descriptive correlational research design was adopted for the study. Consecutive sampling technique was used to draw 110 Type-2 Diabetes Mellitus patients from 3conviniently selected hospitals namely GMCH, GRNC (Dispur) and Nemcare hospital. Data collection was done by using structured interview schedule which was comprised of demographic performa, structured knowledge questionnaire, attitude scale and practice checklist and analyzed in statistical package of social science.* **Results:** *Out of 110 Type-2 Diabetes Mellitus patients majority i.e. 35 (31.8%) belonged to the age group of 41-50 years, 79 (71.8%) were male, 85 (77.3%) belonged to Hindu religion , 33 (30.0%) were primary school pass, 30 (27.2%) were unemployed including homemaker, 29 (26.4%) belonged to monthly family income Rs 39, 033-78,062, 66(60%) had family history of Diabetes Mellitus,51(46.4%)suffered from <1years,and 41(37.3%) got information regarding Diabetes Mellitus from mass media. Majority of the subjects 60 (54.5%) had moderately adequate (10.47±1.76) knowledge; 55 (50.0%) had average (15.60±1.448) attitude, and 61 (55.5%) had average (10.84±2.65) self care practices regarding Type-2 Diabetes Mellitus. Significant moderately positive correlation was found between knowledge and attitude (r=0.403,p<.001); knowledge and self care practices(r=.561, p<.001) and attitude and self care practices (r=0.388, p<.001).Significant association was found between knowledge and selected variables like educational status [χ2(8) 20.69] p<.01, occupational status [χ 2(8) 19.28] p<.05, monthly family income [χ 2(10) 29.20] p<.01,and family history of diabetes mellitus [χ 2(2) 11.09] p<.01; attitude and selected variables like age[χ 2(8) 18.484] p<.05, monthly family income [χ2(10) 21.62] p<.05 and duration of diabetes mellitus [χ2(4)14.219] p<.010; self care practices and selected variables like educational status [χ2(8) 22.99] p<.01, occupational status [χ2(8) 38.127] p<.001, monthly family income [χ 2(10) 39.37] p<.001and family history of diabetes mellitus [χ 2(2) 8.55] p<.05.* **Conclusion:** *The study concluded that most of the Type-2 Diabetes Mellitus patients had moderately adequate knowledge, average attitude and average self care practices regarding Type2 Diabetes Mellitus, which indicated the learning needs of patients. Therefore an information booklet on Type-2 Diabetes Mellitus was prepared and distributed by the investigator.*

Keywords: Type-2 Diabetes Mellitus, Knowledge, Attitude, Self care Practices

1. Introduction

1.1 Background of the study

Diabetes Mellitus (DM) is a chronic multisystem disease characterized by hyperglycemia related to abnormal insulin production, impaired insulin utilization, or both. [1] Diabetes is now seen as a heterogeneous group of diseases, characterized by a state of chronic hyperglycemia, resulting from a diversity of etiologies, environmental and genetic, acting jointly. The underlying cause of diabetes is the defective production or action of insulin, a hormone that controls glucose, fat and amino acid metabolism. Characteristically, diabetes is a long - term disease with variable clinical manifestations and progression. Chronic hyperglycemia, from whatever cause, leads to a number of complications - cardiovascular, renal, neurological, ocular and others such as recurrent infections. [2]

Prevalence of diabetes in adults worldwide was estimated to be 4.0 percent in 1995 and to rise to 5.4 percent by the year 2025. It is higher in developed country than developing countries. The number of adults with diabetes in the world will rise from 135 million in 1995 to 300 million in the year 2025. There will be a 42 percent increase, from 51 to 72 million, in the developed countries and a 170 percent increase, from 84 to 228 million, in the developing countries. Thus, by the year 2025 > 75 percent of people with Diabetes will reside in developing countries, as

compared with 62 percent in 1995. The countries with the largest number of people with Diabetes are India, China and the US. In developing countries the majority of people with Diabetes are in the range of 45 - 64 years. In the developed countries, the majority of people with Diabetes are in the age group of ≥ 65 years. [3]

1.2 Need of the Study

In 2019, approximately 463 million adults (20 - 79 years) were living with diabetes; by 2045 it will reach 700 million. More than 1.1 million children and adolescents are living with type1 diabetes.374 million people are at increased risk of developing Type - 2 Diabetes. [4] The rising prevalence of Diabetes in developing countries is closely associated with the industrialization and socio - economic development, urbanization, increase in obesity and decrease in physical activity. [5]

According to World Health Organization (WHO), India had 69.2 million people living with diabetes in 2015. Nearly 98 million people in India may have Type - 2 diabetes by 2030. The number of adults with Type - 2 diabetes is expected to rise over the next 12 years due to aging, urbanization and associated changes in diet and physical activity. [6]

Diabetes mellitus is associated with micro vascular and macro vascular complications and presents a high mortality and morbidity, with significant reduction in the quality of life of patients. Poor awareness, negative attitudes and inadequate self care practices among diabetic patients are some of the important variables influencing the progression of diabetes and its complications, which are largely preventable through education and involvement of the patient. [7] They are required to follow certain self care practices to achieve an optimal glycemic control and prevent complications. These practices include regular physical activity, appropriate dietary practices, daily foot care practice, compliance with treatment regimen, and tackling complications such as hypoglycemic episodes. [8]

Knowledge plays a vital role in any future disease development and its early prevention and detection and management of the disease. Positive knowledge, attitude and practice are important for DM patients. KAP regarding diabetes vary greatly depending on socio - economic conditions, cultural beliefs and habits. Knowledge of diabetes can prevent the imminent chronic co morbidities of DM, which impact significantly on the quality of life of the diabetes patients. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease for their lifetime. [9] Progression of diabetes in most cases results in chronic complications, increase morbidity and mortality; it also leads to a great economic burden on the health system. A large gap between knowledge, attitude, and practices exist that can be minimized by assessing their current knowledge, attitude and practices and their determinants that can be helpful in future planning for preparation of better educational interventional program for diabetic patients. [10] Thus, the objective of the current study was to assess knowledge, attitude and self care practices so that it will serve as a benchmark for future comparisons.

1.3 Statement of the problem

"A study to assess Knowledge, Attitude and Self Care Practices regarding Type - 2 Diabetes Mellitus among the Patients (Type - 2 DM) in Selected Hospitals of Guwahati, Assam with a view to prepare an Information Booklet."

1.4 Objectives of the study

- To assess the knowledge among patients with Type - 2 Diabetes Mellitus.
- To assess the attitude among patients with Type - 2 Diabetes Mellitus.
- To identify self care practices among patients with Type - 2 Diabetes Mellitus.
- To find out the correlation between knowledge and attitude among patients with Type - 2 Diabetes Mellitus.
- To find out the correlation between knowledge and self care practices among patients with Type - 2 Diabetes Mellitus.
- To find out the correlation between attitude and self care practices among patients with Type - 2 Diabetes Mellitus.
- To find out the association between knowledge and selected demographic variables among patients with Type - 2 Diabetes Mellitus.
- To find out the association between attitude and selected demographic variables among patients with Type - 2 Diabetes Mellitus.
- To find out the association between self care practices and selected demographic variables among patients with Type - 2 Diabetes Mellitus.

1.5 Operational definitions

Knowledge
In the current study knowledge referred to correct response information or the awareness regarding Type - 2 Diabetes Mellitus as assessed by structured interview schedule.

Attitude
In the current study attitude referred idea, values and expression of favors or disfavors towards the disease by the patients with Type - 2 Diabetes Mellitus as assessed by structured interview schedule.

Self care Practice
In the current study, self care practice referred to the activity carried out by the patients with Type - 2 Diabetes Mellitus to maintain and improve their health.

Type - 2 Diabetes Mellitus Patient
In the current study, Type 2 Diabetes Mellitus patient referred to those patients who were clinically diagnosed as Type2 Diabetes Mellitus, aged above 30 years.

Information Booklet
In the current study, information booklet included definition of Type - 2 Diabetes Mellitus, risk factors, signs and symptoms, diagnosis, treatment, complications and prevention of complications of Type - 2 Diabetes Mellitus.

Assumptions

The study was based on the following assumptions:

Knowledge, attitude, self care practices can be assessed by structured interview schedule.

Knowledge, attitude, self care practices varies individual to individual among patients with Type - 2 Diabetes Mellitus.

1.6 Hypotheses

- H_1 - There is a significant relationship between knowledge and attitudes among patients with Type - 2 Diabetes Mellitus at 0.05 level of significance.
- H_2 - There is a significant relationship between knowledge and self - care practices among patients with Type - 2 Diabetes Mellitus at 0.05 level of significance.
- H_3 - There is a significant relationship between attitude and self - care practices among patients with Type - 2 Diabetes Mellitus at 0.05 level of significance.
- H_4 - There is a significant association between knowledge among patients with Type - 2 Diabetes Mellitus with some selected demographic variables at 0.05 level of significance.
- H_5 - There is a significant association between attitudes among patients with Type - 2 Diabetes Mellitus with some selected demographic variables at 0.05 level of significance.
- H_6 - There is a significant association between self - care practices among patients with Type - 2 Diabetes Mellitus with some selected demographic variables at 0.05 level of significance.

1.7 Delimitation

- The study was delimited to the subjects who were clinically diagnosed as Type - 2 Diabetes Mellitus, aged above 30 years.
- The study was delimited to the subjects attending inpatient and outpatient departments of medicine, cardiology and endocrinology ward only.

2. Research Methodology

Research approach - Quantitative Descriptive approach

Research design - Descriptive correlational research design

Settings - This study was conducted in 3 conveniently selected hospitals of Guwahati, namely GMCH, Nemcare Hospital, GNRC hospital (Dispur Branch).

Population - The accessible population of the study was the patients with Type2 Diabetes Mellitus attending inpatient and outpatient departments of medicine, cardiology and endocrinology wards of 3 conveniently selected hospitals, Guwahati.

Sampling technique - Consecutive sampling technique

Sample size - 110

Variable:

- **Demographic variables -** age, gender, religion, education, occupation, monthly family income, family history of diabetes, duration of Diabetes Mellitus, sources of information regarding Diabetes Mellitus
- **Research variables -** knowledge, attitude and self care practices

Tools- Structured Interview schedule: Demographic performa, structured knowledge questionnaire, attitude scale and practice checklist

Criteria for sample selection

Inclusion criteria
- Patients who were willing to participate in the study.

Exclusion criteria
- Critically ill patients (patients with severe respiratory, cardiovascular or neurological problem).
- Pregnant women, including those with gestational diabetes.

3. Analysis and Interpretation

Obtained data were analyzed, organized, categorized and presented under following sections:
- Section I: Description of subject characteristics
- Section II: Assessment of knowledge, attitude and self care practices among patients with Type - 2 Diabetes Mellitus.
- Section III: Correlation between knowledge and attitude; knowledge and self care practices; attitude and self care practices among patients with Type - 2 Diabetes Mellitus.
- Section IV: Association between knowledge, attitude, self care practices and selected demographic variables among patients with Type - 2 Diabetes Mellitus.

Section I: Description of subject characteristics

Table 1: Frequency and percentage distribution of patients with Type - 2 Diabetes Mellitus according to demographic variables, n=110

S. No	Demographic Variables	Frequency (f)	Percentage (%)
1	**Age (in years)**		
	31 - 40	10	9.1
	41 - 50	35	31.8
	51 - 60	34	30.9
	61 - 70	25	22.7
	≥ 71	6	5.5
2	**Gender**		
	Male	79	71.8
	Female	31	28.2
3	**Religion**		
	Hindu	85	77.3
	Muslim	25	22.7
4	**Educational Status**		
	Illiterate	2	1.8
	Primary	33	30.0
	High School	32	29.1
	Higher Secondary	25	22.7
	Graduate & above	18	16.4

5	**Occupational status**		
	Unemployed including homemaker	30	27.2
	Service	29	26.4
	Cultivation	20	18.2
	Business	22	20.0
	Daily Wager	9	8.2
6	**Monthly family income**		
	> Rs.78, 062	6	5.5
	Rs.39, 033 - 78, 062	29	26.4
	Rs.29, 200 - 39, 032	26	23.6
	Rs.19, 516 - 29, 199	24	21.8
	Rs.11, 708 - 19, 515	12	10.9
	Rs.3, 908 - 11, 707	13	11.8
7	**Family history of Diabetes Mellitus**		
	Yes	66	60.0
	No	44	40.0
8	**Duration of Diabetes Mellitus**		
	< 1 Years		
	1 - 10 Years	51	46.4
	>10 Years	46	41.8
		13	11.8
9	**Sources of information regarding Diabetes Mellitus**		
	Health personnel	38	34.5
	Mass media	41	37.3
	Friends and relatives	31	28.2

Section II: Assessment of knowledge, attitude and self care practices among patients with Type - 2 Diabetes Mellitus

The data showed that out of 110 Type - 2 Diabetes Mellitus patients majority i. e.60 (54.5%) had moderately adequate (10.47±1.76) knowledge; 31 (28.2%) had inadequate (4.42±1.50) knowledge, and 19 (17.3%) had adequate (14.21±0.42) knowledge regarding Type - 2 Diabetes Mellitus with overall Mean and SD of all levels of knowledge was 9.41±3.75.

The data also showed that out of 110 Type - 2 Diabetes Mellitus patients majority i.e. .55 (50.0%) had average (15.60±1.448) attitude, 34 (30.9%) had poor (11.91±1.443) attitude and only 21 (19.1%) had good (19.95±1.117) attitude regarding Type - 2 Diabetes Mellitus with overall Mean and SD of all levels of attitude was 15.29±3.114.

The present study also revealed that out of 110 Type - 2 Diabetes Mellitus patients majority i. e.61 (55.5%) had average (10.84±2.65) self care practices; 27 (24.5%) had poor (4.70±1.14) self care practices, and 22 (20.0%) had good (17.09±1.23) self care practices regarding Type - 2 Diabetes Mellitus with overall mean and SD of all levels of self care practices was 10.58±4.65.

Section III: Correlation between knowledge and attitude; knowledge and self care practices; attitude and self care practices among patients with Type - 2 Diabetes Mellitus.

Correlation between knowledge and attitude among patients with Type - 2 Diabetes Mellitus

Significant moderately positive correlation was found between knowledge and attitude among patients with Type - 2 Diabetes Mellitus (r=0.403, p<.001). So the null hypothesis $H0_1$ was rejected and research hypothesis H_1 i. e. there is a significant relationship between knowledge and attitude among patients with Type - 2 Diabetes Mellitus was accepted at 0.001 level of significance.

Correlation between knowledge and self care practices among patients with Type - 2 Diabetes Mellitus

Significant moderately positive correlation was found between knowledge and self care practices among patients with Type - 2 Diabetes Mellitus (r=0.561, p<.001) among patients with Type - 2 Diabetes Mellitus. So the null hypothesis $H0_2$ was rejected and research hypothesis H_2 i. e. There is a significant relationship between knowledge and self - care practices among patients with Type - 2 Diabetes Mellitus was accepted at 0.001 level of significance.

Correlation between attitude and self care practices among patients with Type - 2 Diabetes Mellitus

Significant moderately positive correlation was found between attitude and self care practices among patients with Type - 2 Diabetes Mellitus (r=0.388, p<0.001). So the null hypothesis $H0_3$ was rejected and research hypothesis H_3 i.e. There is a significant relationship between attitude and self care practices among patients with Type - 2 Diabetes Mellitus was accepted at 0.001 level of significance.

Section IV: Association between knowledge, attitude, self care practices and selected demographic variables among patients with Type - 2 Diabetes Mellitus.

Association between knowledge and selected demographic variables among patients with Type - 2 Diabetes Mellitus

The data showed that calculated chi - square value for the knowledge of Type - 2 Diabetes Mellitus patients with educational status was 20.69 (tabulated value 20.09) with df=8, p value =.008. Hence, significant association was found between knowledge and educational status of the Type - 2 Diabetes Mellitus patients. The data also showed that calculated chi - square value for the knowledge of Type - 2 Diabetes Mellitus patients with occupational status was 19.28 (tabulated value 15.51) with df=8, p value =0.013. Hence, significant association was found between knowledge and occupational status of the Type - 2 Diabetes Mellitus patients. The data also revealed that calculated chi - square value for the knowledge of Type - 2 Diabetes Mellitus patients with monthly family income was 29.20 (tabulated value 23.21) with df=10, p value =.001. Hence, significant association was found between knowledge and monthly family income of the Type - 2 Diabetes Mellitus patients. The data also showed that calculated chi - square value for the knowledge of Type - 2 Diabetes Mellitus patients with family history of DM was 11.09 (tabulated value 9.21) with df=2, p value =.004. Hence, significant association was found between knowledge and family history of DM of the Type - 2 Diabetes Mellitus patients. No significant association was found between knowledge and selected demographic variables like age, gender, religion, duration of the Diabetes Mellitus and sources of information regarding Diabetes. Hence, the null hypothesis (H_{04}) was rejected and the research hypothesis (H_4) i.e. There is a significant association between knowledge among patients with Type - 2 Diabetes Mellitus with some selected demographic variables was accepted in case of educational

status, occupational status, monthly family income and family history of Diabetes Mellitus**.**

Association between attitude and selected demographic variables among patients with Type - 2 Diabetes Mellitus
The data showed that calculated chi - square value for the attitude of Type 2 Diabetes Mellitus patients with age was 18.484 (tabulated value 15.51), with df=8, p value =.018. Hence, significant association was found between attitude and age of the Type 2 Diabetes Mellitus patients. The data also showed that calculated chi - square value for the attitude of Type - 2 Diabetes mellitus patients with monthly family income was 21.62 (tabulated value 18.31) with df=10, p value =.017, Exact P=.026. Hence, significant association was found between attitude and monthly family income of the Type - 2 Diabetes Mellitus patients. The data also revealed that calculated chi - square value for the attitude of Type - 2 Diabetes Mellitus patients with duration of DM was 14.219 (tabulated value 9.49) with df=4, p value =.007. Hence, significant association was found between attitude and duration of DM of the Type - 2 Diabetes Mellitus patients. No significant association was found between attitude and selected demographic variables like gender, religion, educational status, occupational status, family history of Diabetes Mellitus**,** and sources of information regarding Diabetes. Hence, the null hypothesis (H_{05}) was rejected and the research hypothesis (H_5) i. e. There is a significant association between attitude among patients with Type - 2 Diabetes Mellitus with some selected demographic variables was accepted in case of age, monthly family income and duration of Diabetes Mellitus.

Association between self care practices and selected demographic variables among patients with Type - 2 Diabetes Mellitus
The data showed that calculated chi - square value for the self care practices of Type - 2 Diabetes Mellitus patients with educational status was 22.99 (tabulated value 20.09) with df=8 p value =.003. Hence, significant association was found between self care practices and educational status of the Type - 2 Diabetes Mellitus patients. The data also showed that calculated chi - square value for the self care practices of Type - 2 Diabetes Mellitus patients with occupational status was 38.12 (tabulated value 15.51) with df=8 p value <.001. Hence, significant association was found between self care practices and occupational status of the Type - 2 Diabetes Mellitus patients. The data also revealed that calculated chi - square value for the self care practices of Type - 2 Diabetes Mellitus patients with monthly family income was 39.37 (tabulated value 29.59) with df=10 p value<.001. Hence, significant association was found between self care practices and monthly family income of the Type - 2 Diabetes Mellitus patients. The data also showed that calculated chi - square value for the self care practices of Type - 2 Diabetes Mellitus patients with family history of DM was 8.55 (tabulated value 5.99) with df=2 p value =.014. Hence, significant association was found between self care practices and family history of DM of the Type - 2 Diabetes Mellitus patients. No significant association was found between self care practices and selected demographic variables like age, gender, religion, duration of the Diabetes Mellitus and sources of information regarding Diabetes. Hence, the null hypothesis (H_{06}) was rejected and the research hypothesis (H_6) i. e. There is a significant association between self care practices among patients with Type - 2 Diabetes Mellitus with some selected demographic variables was accepted in case of educational status, occupational status, monthly family income and family history of Diabetes Mellitus**.**

4. Discussion

Objective1: to assess the knowledge among patients with Type - 2 Diabetes Mellitus
The findings of the present study showed that majority that is 54.5 percent Type - 2 DM patient had moderately adequate knowledge, 28.2 percent had inadequate knowledge and 17.3 percent had adequate knowledge regarding Type - 2 Diabetes Mellitus. The findings of the present study is supported by a study conducted by Singha N (2005) on 60 diabetic patient age group of 40 - 70 years to assess the knowledge and attitude of diabetes mellitus patients regarding self - administration of insulin injection among diabetes mellitus patients regarding self - administration of insulin injection where 81.7 percent had average knowledge, 13.3 percent had poor knowledge and only 5 percent had good knowledge regarding self - administration of insulin injection. [11]

Objective 2: to assess the attitude among patients with Type - 2 Diabetes Mellitus
The findings of the present study revealed that 50.0 percent of the patients (Type2DM) had average attitude, 30.9 percent had poor attitude and 19.1 percent had good attitude. The findings of the present study is supported by a study conducted by a study conducted by NagarV, Prasad P, Mitra A, Kale S, Yadav K, Shukla M (2018) on 150 adults with Diabetes Mellitus, found that 56.6 percent had negative attitude and 43.3 percent subjects had positive attitude. [10]

Objective 3: to assess identify self - care practices among patients with Type - 2 Diabetes Mellitus
The present study findings showed that majority i. e.55.5 percent of the Type - 2 Diabetes Mellitus patients had average self care practices, 24.5 percent had poor self care practices, and 20.0 percent had good self care practices regarding Type - 2 Diabetes Mellitus. The findings of the present study is supported by a study conducted by Ghadge SC, Gholap CM, Mohite RV, Choudhary SK (2019) on 100 samples to assess diabetic patient's knowledge, attitude and practice regarding blood glucose monitoring, which found that the level of practice were found to be good in 24%, average in 48% and poor in 28%. [12]

Objective 4: to find out the correlation between knowledge and attitudes among patients with Type - 2 Diabetes Mellitus
The present study revealed that there was significant moderately positive correlation between knowledge and attitudes among patients with Type - 2 Diabetes Mellitus. The calculated value of correlation co - efficient 'r' found to be 0.403 and p value was <.001. Similarly, a study conducted by Salem A, Majed A, Mustafa MAM, Abdulsalam A, Asdaq SMB, Mohammed A. (2018) among 784 adult subjects aged 18 years and above in outpatient departments of two hospitals of Riyadh, Saudi Arabia with

the aim to explore knowledge, attitude and practice (KAP) regarding DM among non - diabetic population and diabetes mellitus patients also revealed better knowledge was associated with better attitude (adjusted r^2=0.563, P=0.000). [13]

Objective 5: to find out the correlation between knowledge and self care practices among patients with Type - 2 Diabetes Mellitus

The present study findings revealed that there was significant moderately positive correlation between the knowledge and self care practices. The calculated value of correlation co - efficient 'r' found to be 0.561 and p value was <.001. Similarly, the study findings conducted by Ghannadi S, Amouzegar A, Amiri P, Karbalaeifar R, Tahmasebinezed, Ardebili SK (2016) to evaluate KAP on self - management of 117 type 2 diabetic patient, found that there was significant correlation between patient's knowledge and practice with their self care activities. [14]

Objective 6: to find out the correlation between attitude and self care practices among patients with Type - 2 Diabetes Mellitus

The present study indicated that there was significant moderately positive correlation between attitude and self care practices. The calculated value of correlation co - efficient 'r' found to be 0.388 and p value was <.001. Similarly, the study conducted by study conducted by Salem A, Majed A, Mustafa MAM, Abdulsalam A, Asdaq SMB, Mohammed A. (2018) among 784 adult subjects aged 18 years and above in outpatient departments of two hospitals of Riyadh, Saudi Arabia with the aim to explore knowledge, attitude and practice (KAP) regarding DM among non - diabetic population and diabetes mellitus patients revealed positive attitude was associated with positive practice. (adjusted r^2=0.585, P=0.000). [13]

Objective7: to find out the association between knowledge and selected demographic variables among patients with Type - 2 Diabetes Mellitus

The present study revealed that significant association was found between knowledge and selected demographic variables like educational status, occupational status, monthly family income, family history of diabetes mellitus. Similar findings was found in the another study conducted by Tejaswi P, S. Dharkre, P Reddy, C Goyal (2018) on 100 type 2 diabetes mellitus patient admitted in the general medicine ward in Central, where the knowledge score showed significant association with education, occupation and socio economic status. [15]

Objective 8: to find out the association between attitude and selected demographic variables among patients with Type - 2 Diabetes Mellitus

The present study findings showed significant association between attitude and selected demographic variables like age, monthly family income and duration of Diabetes Mellitus. Similarly, the findings of the study conducted by Gillani AH, Amirul Islam FM, Hayat K, Atif N, Yang C, Chang J. et al (2018) on 2019 adults aged 18 - 90years also found that respondents with high socio - economic status showed significantly higher positive attitude compared with those with low socio - economic status. [16]

Objective 9: to find out the association between self care practices and selected demographic variables among patients with Type - 2 Diabetes Mellitus

The present study findings showed significant association between self care practices and selected demographic variables like educational status, occupational status, monthly family income, family history of diabetes mellitus. Similar findings was revealed in the study conducted by NagarV, Prasad P, Mitra A, Kale S, Yadav K, Shukla M (2018) on 150 adults with Diabetes Mellitus, that highly educated individuals had better practice regarding planned diet and regular exercise habit. [10]

5. Nursing Implications

Nursing education

Nursing education helps the nursing students to enhance adequate knowledge, positive attitude to fulfill their duties and responsibilities towards patients in the hospital, community people and other health care setting. From the findings of the present study, it was revealed that patients in the hospital had moderate knowledge regarding Type - 2 DM, as early diagnosis is a key to prevent some disease like DM which needs optimum knowledge on the disease. So, the findings of the study can be used by nurse educator to sensitize the patients in the hospital regarding the disease. The nurse educator can also use the findings of the study to understand the magnitude of the problem. She should strengthen the subject among the students, nurses and all health personnel and give the responsibility to teach the hospital patient and teaching should be repeated until they gain the optimum level. The present study suggest that it is necessary for the nurse to have adequate knowledge, good attitude and good self care practices regarding Type - 2 DM. Reemphasize should be given in the nursing curriculum regarding Type - 2 DM, which will help in the primary prevention of the disease and hence can reduce the global burden of the disease.

Nursing practice

It is always the prevention is better than cure. Nurse's role covers the promotive, preventive, curative and rehabilitative aspects of care. So, if the patients in the hospital are imparted with the required knowledge they can minimize the adverse complications which may occur due to Type - 2 DM. Since, education is one of the powerful tools for imparting knowledge and understanding and health teaching being a part of nursing practice, it should be planned systematically and should be based on the need of the target population to enhance knowledge and correct practice. The findings of the study will help the nurse who is working in the hospital to develop insight into the importance of health education in their clinical practice in maintaining the health of the patients with Type - 2 DM and prevent complications regarding this disease.

Nursing administration

Nurse as an administration plays an important role in educating the professional and in policy making. The nurse administrator should take initiative to conduct in - service - training for the additional change in behavior of the health care provider at hospital setting. Refresher courses can also be held to update the knowledge of the nursing personnel.

Nursing administration can organize an awareness program whereby teaching about Diabetes Mellitus for improving the level of knowledge of the students. Community nurse administrator should be encouraged and instruct nurse or health professional for conducting awareness program on diabetes.

Nursing research
The findings of the study serve as the basis for the professional and the students to conduct further study. Nursing research is the means by which nursing profession is growing. The findings of the present study will help in expansion and extension and addition of new evidences in the field of research and statistics. The present methodology will guide future researcher to conduct similar type of studies.

6. Conclusion

The conclusion drawn based on the findings of the present study which showed that majority of the Type 2 Diabetes Mellitus patients had moderately adequate knowledge, average attitude and average self care practices regarding Type - 2 Diabetes Mellitus. Thus it can be inferred that due to lack of adequate knowledge on Type - 2 Diabetes Mellitus the patients had average attitude which ultimately affected the self care practices regarding Type - 2 Diabetes Mellitus. The study findings also revealed that significant moderately positive correlation was found between knowledge and attitude; knowledge and self care practices; attitude and self care practices among the patients with Type - 2 Diabetes Mellitus. It can be inferred that adequate knowledge leads to good attitude among the patients with Type - 2 Diabetes Mellitus. Similarly, if knowledge and attitude increases, self - care practices also supposed to be increased among patients with Type - 2 Diabetes Mellitus. The study findings also showed that there was a significant association between knowledge and selected demographic variables like educational status, occupational status, monthly family income and family history of diabetes mellitus; attitude and selected variables like age, monthly family income and duration of Diabetes Mellitus; self care practices and selected variables like educational status, occupational status, monthly family income, and family history of diabetes mellitus. Thus it can be inferred that knowledge was depended on educational status, occupational status, monthly family income and family history of diabetes mellitus, attitude was depended on age, monthly family income and duration of Diabetes Mellitus and self care practices were depended on educational status, occupational status, monthly family income and family history of diabetes mellitus.

This study indicated the learning needs of the Type - 2 Diabetes Mellitus patient. Therefore an information booklet on Type - 2 Diabetes Mellitus was prepared and distributed by the investigator. The study also highlighted the need to develop pragmatic interventions incorporating various strategies to improve dietary habits and to enjoy a healthy life style. As early diagnosis is a key to prevent and reduce the incidence of Diabetes which requires optimum knowledge regarding the disease, so it is very essential to conduct some educational awareness program especially in the community to make the community people aware of the disease.

7. Limitation

The limitations of the study were as follows:
- Study setting was confined to only three conveniently selected hospitals, one government i. e. GMCH and two private i. e. GNRC hospital (Dispur) and Nemcare Hospital.
- Study used consecutive sampling so investigator cannot conclude the subjects to be representative of entire population. Hence generalization is less likely.
- The questionnaire was structured. Hence the response is limited.

8. Recommendation for the Further Study

- A similar study can be replicated on larger sample where findings can be generalized.
- Similar study can be conducted to compare the knowledge, attitude and self care practices among patients with Type - 2 Diabetes Mellitus between urban and rural population.
- A study may be conducted to evaluate the effectiveness of information booklet on Type - 2 Diabetes Mellitus.
- A study may be conducted to evaluate the effectiveness of structured teaching program on Type 2 Diabetes Mellitus.

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