ORIGINAL ARTICLE

ScienZTech

INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND LIFE SCIENCES

Published by ScienzTech Publication Journal Home Page: www.scienztech.org/ijprls

Pharmacist Participation in Diabetes-Related Distress Assessment and Role of Self Management Among Type-2 Diabetes Mellitus Patients in a Tertiary Care Hospital

Parthasarathy G*, Freshil Francis, Mahashakti Yadav, Sadasivam Harish Kumar, Vinay N

Department of Pharmacy Practice, The Oxford College of Pharmacy, Hongasandra, Bengaluru-560068, Karnataka, India

Article History:

Received on: 02 Dec 2022
Revised on: 07 Jan 2023
Accepted on: 10 Jan 2023

Keywords:

Knowledge, Glycated Hemoglobin, Self-Management, Glycemic Control, HbA1c

ABSTRACT

According to the World Health Organization (WHO), diabetes is a state of chronic hyperglycemia resulting from decrease in insulin engenderment (type 1) (or) decremented insulin uptake by cells (type 2) leading to multitude of complications ranging from diseases of the diminutive vessels of kidney and retina, peripheral neuropathy and coronary artery disease. Diabetes distress is defined as patient concerns about disease management, support, emotional burden and access to care, is an important condition distinct from depression. It is a part of diabetes and it is a non-psychiatric disease. Diabetes related distress (DRD) refers to the emotional and behavioural changes caused by diabetes. A p-value of less than 0.05 is considered significant. Our study shows the scores of specific diet does not show significant correlation in DDS-17 (r=-0.101) whereas a significant correlation was found in SDSCA (0.206). Similarly, the scores in exercise does not show a significant correlation in DDS-17 (r=0.03) but shows a significant correlation in SDSCA (0.666). It reveals Patients tend to have high and low diabetes distress depending upon their diabetes self-care specifically related to diet intake. Moreover women are more prone to experience diabetes distress. This was confirmed by using the (DDS-17) and (SDSCA). Age, smoking, alcohol, consumption, emotional burden, physical inactivity was found to contribute to the development of diabetes related distress in the study subjects.

*Corresponding Author

Name: Parthasarathy G
Phone:
Email: mypartha@gmail.com

eISSN: 2321-4598

DOI: https://doi.org/10.26452/ijprls.v11i1.1468

Production and Hosted by

ScienzTech.org

INTRODUCTION

Diabetes is one of the most common chronic disease. It is a Long-term chronic illness frequently brings difficulties in patient's lives, transmutes the way patients visually perceive themselves, bring financial hardship and even perturbs the family dynamics and cause stress [1].

According to the World Health Organization (WHO), diabetes is a state of chronic hyperglycemia resulting from decrease in insulin engenderment(type 1) (or)decremented insulin uptake by cells (type 2) leading to multitude of complications ranging from diseases of the diminutive vessels of kidney and retina, peripheral neuropathy and coronary artery disease. Diabetes demands perpetual care by maintaining treatment complications, diet management, blood sugar levels so as to avert adverse conditions [2].

Type 2 diabetes is a chronic metabolic disorder in which prevalence has been incrementing steadily all over the world. As a result of this trend, it is expeditious becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decennium due to an increment in senescent population, thereby integrating to the already subsisting burden for healthcare providers, especially in poorly developed countries [3].

Study Design

Retrospective Co-Relational Study.

Sources of Data

The data for the study was taken from

1. Patients case file.
2. Personal interview with the patients/ patient's attendant.
3. Responses provided in the questionnaires.
4. Medication Prescription.

Study Period

The prospective Co-relational study was carried out for 6 months among in-patients and out-patients of general medicine and general surgery department from August 2020 to January 2021.

Formula Use

The following equations are used for calculating sample size:

$$X = \frac{z^{2*}P*(1-P)}{C^2}$$

$$n = NX \ / \ X + N - 1$$

Diabetes Distress Scale (DDS-17)

The DDS is a 17-item scale that captures four critical dimensions of distress: emotional burden, regimen distress, interpersonal distress and physician distress. First published in 2005, it has been used widely around the world as a clinical instrument for opening conversation with one's patients as well as critical outcome measures in numerous studies [4].

The Diabetes Distress Scale (DDS17) yielded a total diabetes distress scale score plus 4 subscale scores, each of which addressed a different kind of distress. A mean item score of 3 or higher was considered as a level of distress which was worthy of clinical attention.

Summary of the Diabetes Self-Care Activities Scale (SDSCA)

This scale was developed by Toobert and Glasgow, it has acceptable reliability and validity. It contains 12 questions about diet, exercise, blood sugar test, foot care and medication. The scale induced the diabetes self-care activities of the patients during the past 7 days. A score of less than three was considered as inadequate, while a score of more than three was considered as adequate (good self-care).

Methodology

This is a retrospective co-relational study conducted in Oxford Medical College Bangalore. The study samples were collected from both the general medical Ward and General Surgery Department. A total of 90 patients who were admitted in the departments were interviewed using structured interview questionnaire which was pre-designed, the DDS-17 Questionnaire which is a set of 17 items belonging to 4 domains and also the SDSCA Questionnaire.

The DDS is a 17-item scale that captures four critical dimensions of distress: emotional burden, regimen distress, interpersonal distress and physician distress. First published in 2005, it has been used widely around the world as a clinical instrument for opening conversation with one's patients as well as critical outcome measures in numerous studies.

The Diabetes Distress Scale (DDS17) yielded a total diabetes distress scale score plus 4 sub scale scores, each of which addressed a different kind of distress. A mean item score of 3 or higher was considered as a level of distress which was worthy of clinical attention.

The SDSCA questionnaire was developed using principal component method and 4 domains were identified. The overall standardized questionnaire shows good responsiveness to metabolic control and co-morbidities establishing discriminate validity and hence serves as a very reliable and valid tool for the assessment of quality of life of Indian patients with Diabetes. The questionnaire was used to assess the quality of life, degree of satisfaction in patients. We have used scoring to evaluate the condition of the patient with respect to self-care activity. Participants were chosen voluntarily and written consent was obtained before the administration of the questionnaire to individual patients. Confidentiality of the participants was maintained. If the participants couldn't understand the questionnaires, due to language problems he/she were given local language (Kannada) questionnaire. The study procedure consisted of the following steps:

Stages

1. Step 1: To obtain consent from the patient through informed consent form in English and Kannada languages.

2. Step 2: Collection of demographics of the patient (Name, Age, Sex, etc.) and the date regarding past medical history, past medication history, diagnosis, prescribed drugs, etc through data entry form.
3. Step 3: To assess the diabetes distress of patient by using DDS-17 scale.
4. Step 4: To assess the self-management of patient using SDSCA scale.
5. Step 5: To evaluate the scores obtained from DDS-17 scale and SDSCA scale.
6. Step 6: The obtained data will be subjected for suitable statistical methods like Mean, P-value, Chi-square, Pearson-correlation.

Statistical Analysis

Microsoft word and Excel have been used to generate graphs, and tables for the analysis of the data. Student t-test is used in our study for statistical analysis. The generated data of p-value was obtained using statistical tool such as SPSS software package.

RESULTS

This study includes 90 patients who were admitted to the general medicine department with diabetes mellitus.

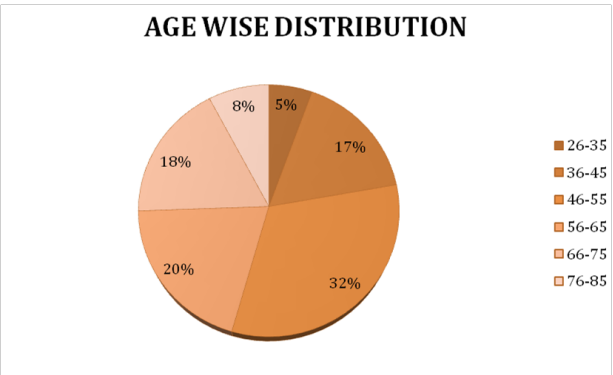

Figure 1: Age Wise Distribution of Subjects

Age Distribution

Figure 1 indicates the age wise distribution of 90 patients where 10 years of age interval was taken into consideration, the youngest being 21 and oldest 80 years of age. The above data also shows that patients in the age group of 46-55 years were more affected [Table 1].

Gender Wise Distribution

The above data from Figure 2 indicates that men (54%) are more affected with type 2 diabetes mellitus than women (46%) [Table 2].

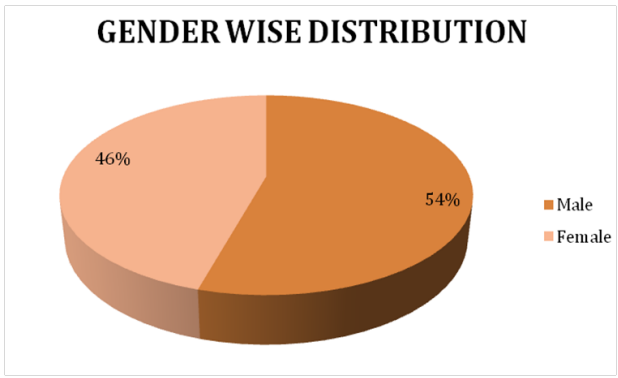

Figure 2: Gender Wise Distribution of Subjects

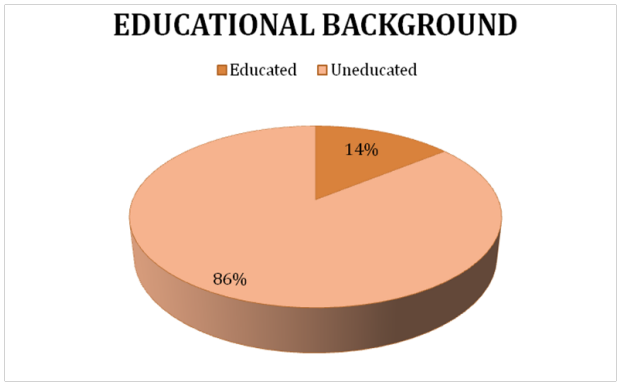

Figure 3: Educational Background of Study Subjects

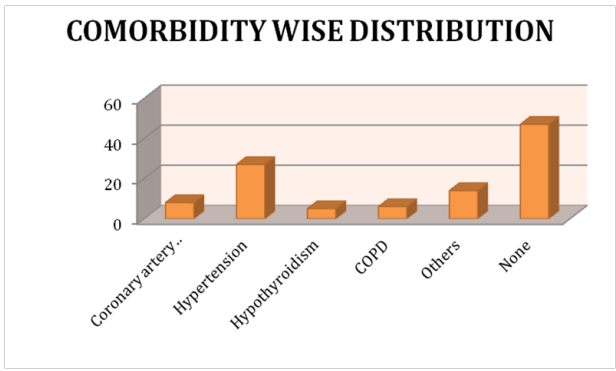

Figure 4: Distribution Based on Comorbidities

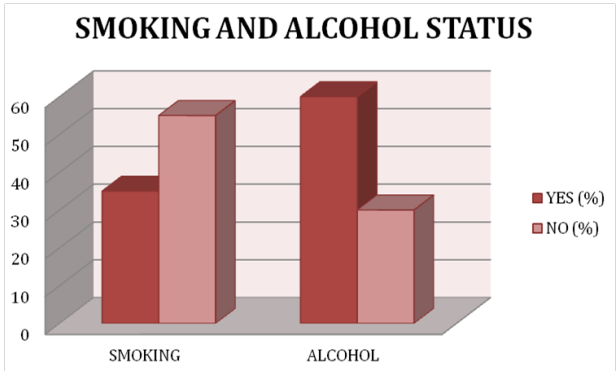

Figure 5: Smoking and Alcohol Consumption Status

Table 1: : Age-wise distribution of study participants

Age	No. of patients (N=90)	Percentage
26-35	5	5%
36-45	15	17%
46-55	29	32%
56-65	18	20%
66-75	16	18%
76-85	7	8%

Table 2: Gender wise distribution of study participants

Gender	No. of patients (N=90)	Percentage
Male	49	54%
Female	41	46%

Table 3: Educational Background of Study Participants

Education	No. of patients (N=90)	Percentage
Educated	13	14%
Uneducated	77	86%

Table 4: Distribution of study participants based oncomorbidities

Comorbidity	No. of patients (N=90)	Percentage
Coronary artery disease	8	7%
Hypertension	27	25%
Hypothyroidism	5	5%
COPD	6	6%
Others	14	13%
None	47	44%

Table 5: Details about smoking and alcohol consumption

(N=90)	Smoking	Alcohol
Yes	35	60
No	55	30

Table 6: Total Scoring Based on Diabetes Distress Scale –17

Scale range	No. of patients (N=90)	Percentage
High (3 and >3)	46	57%
Moderate (2-2.9)	23	25%
Low (< 2)	21	18%

Table 7: DDS 17 Questionnaire Form Domains

	No. of patients (n=90)	%
Emotional Burden		
<2	6	6.7
2-4	61	67.8
>4	23	25.6
Physician distress		
<2	30	33.3
2-4	57	63.3
>4	3	3.3
Regimen distress		
<2	8	8.9
2-4	64	71.1
>4	18	20.0
Interpersonal distress		
<2	27	30.0
2-4	35	38.9
>4	28	31.1
General Diet		
<2	0	0.0
2-4	24	26.7
>4	66	73.3
Specific diet		
<2	4	4.4
2-4	69	76.7
>4	17	18.9
Exercise		
<2	8	8.9
2-4	51	56.7
>4	31	34.4
Blood sugar testing		
<2	20	22.2
2-4	39	43.3
>4	31	34.4
Foot Care		
<2	11	12.2
2-4	54	60.0
>4	25	27.8
Smoking 1		
0	53	58.9
1	37	41.1

Table 8: DDS-17 subdomain scores

DDS-17 Sub Domains	Scales	Mean ± SD	T value	P value
1. Emotional burden	Greater than or equal to 2	3.351 ± 0.810	4.8111	< 0.05*
	Less than 2	1.750 ± 0.176		
2. Physician distress	Greater than or equal to 2	2.9225 ± 0.6365	13.4696	< 0.05*
	Less than 2	1.3000 ± 0.2374		
3. Regimen distress	Greater than or equal to 2	3.3951 ± 0.7795	6.3410	<0.05*
	Less than 2	1.6313 ± 0.2434		
4. Interpersonal distress	Greater than or equal to 2	3.7225 ± 1.0274	12.7786	< 0.05*
	Less than 2	1.1630 ± 0.2221		

*Unpaired t test; significant if p <0.05

Table 9: Scoring as per SDSCA

Parameter	Mean ± Standard deviation		T statistic	P value
	Greater than or equal to 18	Less than 18		
SDSCA score	21.73 ± 6.1	13.4 ± 7.68	13.994	< 0.05*

*Unpaired t test, significant if p<0.05; For the 90 patients the mean and standard deviation is calculated; A p-value of less than 0.05 is considered significant

Table 10: Total SDSCA Score

Total SDSCA Score	No. of patients	%
<18	73	81.1
18-30	17	18.9
Total	90	100.0

Table 11: SDSCA Subdomain Scores

SDSCA Sub Domains	Scales	Mean ± SD	T value	P value
1. General diet	Greater than 3.5	5.274 ± 0.858	8.8451	< 0.05*
	Less than 3.5	2.563 ± 0.320		
2. Specific diet	Greater than 3.5	4.470 ± 1.007	10.906	< 0.05*
	Less than 3.5	2.538 ± 0.548		
3. Exercise	Greater than 3.5	4.628 ± 0.757	13.794	< 0.05*
	Less than 3.5	2.245 ± 0.871		
4. Blood sugar testing	Greater than 3.5	4.620 ± 0.890	13.808	< 0.05*
	Less than 3.5	1.900 ± 0.975		
5. Foot care	Greater than 3.5	4.623 ± 1.224	10.251	< 0.05*
	Less than 3.5	2.014 ± 1.133		
6. Smoking	Equal to 1	19	NIL	NIL
	Equal to 0	71		

Unpaired t test; significant if p <0.05

Table 12: Descriptive Statistics

	Min	Max	Mean	SD
Total DDS 17 score	0.76	4.50	2.99	0.90
Emotional Burden	1.40	5.00	3.24	0.88
Physician distress	1.00	4.50	2.38	0.94
Regimen distress	1.25	6.30	3.24	0.90
Interpersonal distress	1.00	6.00	2.95	1.46
General Diet	2.00	7.00	5.03	1.13
Specific diet	1.00	6.50	3.61	1.27
Exercise	0.00	7.00	3.38	1.45
Blood sugar testing	0.00	6.00	3.41	1.64
Footcare	0.00	7.00	3.55	1.75
Total SDSCA Score	8.00	28.50	19.33	4.57

Table 13: Pearson Correlation

Pair	r value	P value
Total DDS 17 score vs Emotional Burden	0.879	<0.001**
Total DDS 17 score vs Physician distress	0.760	<0.001**
Total DDS 17 score vs Regimen distress	0.740	<0.001**
Total DDS 17 score vs Interpersonal distress	0.908	<0.001**
Total DDS 17 score vs General Diet	0.226	0.032*
Total DDS 17score vs Specific diet	-0.101	0.343
Total DDS 17 score vs Exercise	0.034	0.753
Total DDS 17 score vs Blood sugar testing	0.351	0.001**
Total DDS 17 score vs Footcare	0.201	0.057+
Total DDS 17 score vs Total SDSCA score	0.251	0.017*
Total SDSCA score vs Total DDS 17 score	0.251	0.017*
Total SDSCA score vs Emotional Burden	0.180	0.090+
Total SDSCA score vs Physician distress	0.341	0.001**
Total SDSCA score vs Regimen distress	0.135	0.205
Total SDSCA score vs Interpersonal distress	0.200	0.058+
Total SDSCA score vs General Diet	0.555	<0.001**
Total SDSCA score vs Specific diet	0.206	0.051+
Total SDSCA score vs Exercise	0.666	<0.001**
Total SDSCA score vs Blood sugar testing	0.791	<0.001**
Total SDSCA score vs Footcare	0.746	<0.001**

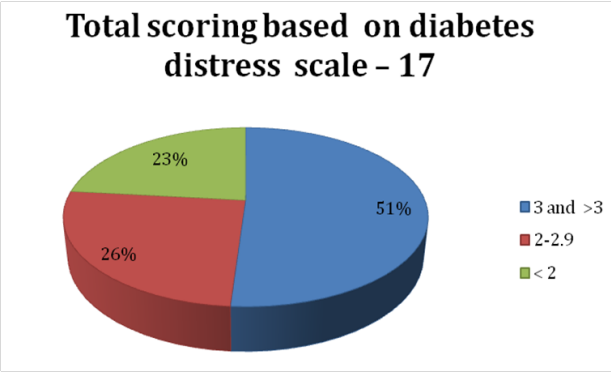

Figure 6: Total Scoring Based on DDS-17

Educational Background

The above data from Figure 3 indicates that most of the patients in this study were uneducated (86%) when compared to those educated (14%) [Table 3].

Distribution Based on Comorbidities

The Table 4 indicates that majority of patients in the study with DM had no comorbidities (44%) followed by a single comorbidity like hypertension (25%) being the highest [Figure 4].

Smoking and Alcohol Consumption

The Table 5 shows that the number of subjects who

involved in smoking was fewer (35) than compared to those who consumed alcohol (60) [Figure 5].

Total Scoring Based on Diabetes Distress Scale – 17

The DDS is a 17-item scale that captures four critical dimensions of distress: emotional burden, regimen distress, interpersonal distress and physician distress. Based on the choices made by the study subjects, scores were given for each question and total overall score is given as follows:

From the results its clearly evident that majority of the patients (57%) had higher distress based on the DDS-17 scale scores followed by moderate distress (25%) and then low distress (18%) [Table 6 and Figure 6].

DDS-17 Sub Domain Scores

From the Table 8, p values of all the 4 sub domains of DDS-17 (emotional burden, physician distress, regimen distress and interpersonal distress) were found to be statistically significant ($p < 0.05$) in all groups ie., all the subdomains had a p-value of below 0.05 [Table 7].

Scoring as per Summary of the Diabetes Self-Care Activities Scale (SDSCA)

SDSCA contains 12 questions about diet, exercise, blood sugar test, foot care and medication. The scale induced the diabetes self-care activities of the patients during the past 7 days. A mean score of less than 18 was considered as adequate, while a score of more than 18 was considered as inadequate (poor self-care) [Table 9].

Total SDSCA Score

From the above results its clearly evident that majority of the patients (81.1%) had a lesser SDSCA score i.e., less than 18 based on the scale scores followed by (18.9%) patients having score between 18-30 [Table 10].

SDSCA Sub Domain Scores

From the Table 11, P values of 5 subdomains out of 6 (general diet, specific diet, exercise, blood sugar testing, foot care and smoking) of were found to be statistically significant in the 5 domains ie., all the subdomains had a p-value of below 0.05.

Domain analysing smoking makes it evident that the number of subjects whose score equalled 0 (non-smoking) is higher that is 71 than those whose score equalled 1 (smoking) which is 19.

Table 12 shows the comparison between 2 questionnaires DDS-17 and SDSCA. Comparing the scores of questionnaires on emotional burden, physician distress, interpersonal distress, general diet, blood sugar testing and foot care, a significant correlation was found in both DDS-17 and SDSCA questionnaires.

Table 13 shows the scores of specific diet does not show significant correlation in DDS-17 ($r=-0.101$) whereas a significant correlation was found in SDSCA (0.206). Similarly the scores in exercise does not show a significant correlation in DDS-17 ($r=0.03$) but shows a significant correlation in SDSCA (0.666).

DISCUSSION

Quality of life is defined as individuals' perception of their position in life and refers to the patient's ability to enjoy normal life activities. Diabetes distress is defined as patient concerns about disease management, support, emotional burden and access to care, is an important condition distinct from depression. Diabetes distress is a part of diabetes and it is non-psychiatric distress. Addressing diabetes-distress improves both self-care and glycemic control. Many people experience considerable distress about having diabetes and the amount of hands-on management that diabetes requires. This often includes frustration with ongoing obligations of diet, physical activity, blood glucose monitoring and taking medicines.

The demographics and clinical characteristics were similar to reports of other studies that assessed the quality of life of patients with diabetes related distress. In this study, the total number of subjects were 90 out of which 49 of them constituted male and 41 female subjects. The larger part of the subjects fell under the age group of 46-55 (32%) and 56-65 (20%). Reports on educational background suggested that majority of the subjects were illiterate (86%).

This is a prospective correlation study to assess and compare the diabetes related distress with self-care activity. The quality of life was assessed using the Diabetes distress scale-17 (DDS-17) questionnaire and the Summary of Diabetes Self-Care Activity (SDSCA) questionnaire similar to the study conducted by Rehan Set al. [5], which included 100 subjects who were given both questionnaires to evaluate their QOL.

The study also reveals that type-2 diabetes mellitus is predominantly higher in case of males (54%) when compared to females (46%) similar to the findings of study conducted by Aljuaid MO et al. [1], on prevalence of diabetes-related distress assessment among type-2 diabetes patients in men and women in the general population.

As per study conducted by Islam MR et al.,2017 diabetes related distress usually effects people in the 4^{th} and 5^{th} decades of life. Similar results were found in the present study which revealed that majority of the cases belonged to age groups of 46-55 (32%) followed by 56-65 (20%).

The educational background report of the study subjects here revealed that most of the subjects belonged to category of illiterates (86%) and literates (14%) which means that they were not well educated which could have led to the ignorance of symptoms and primary manifestations. A study conducted by Huanget al., 2018 regarding the association between Qol and health literacy concluded by saying that inadequate literacy may contribute to poorer quality of life.

A study conducted by Kushwaha AS et al., 2013 found that the prevalence of diabetes related distress increases with age. This is usually found in people with low self-care activity including emotional burden, physical inactivity etc.

This study also found similar prevalent factors like increased age, smoking, alcohol consumption, emotional burden, interpersonal distress, general diet, exercise were all common among the study subjects.

Limitations

1. Since this is a follow-up study sometimes subjects may not show up due to personal reasons which will further cause inappropriate statistical results and also delay and effect proper recovery of the patients condition.
2. Study was conducted for short duration
3. Data with higher amount of authenticity can be obtained if other hospitals are also included in the study.
4. Most of the details on the basis of self-report. So chances of recall bias are more.

Future Directions

Results from the study confirm the need of self-care activity for patients with diabetes related distress which will result in better quality of life. So the future studies should be done with larger sample size to sustain the outcomes of the study.

CONCLUSION

This is a retrospective co-relational study carried out on patients with diabetes in a tertiary care hospital and mainly focused on assessment of patients with diabetes related distress. This study also aims at assessment of self-care activities of such patients. This study concluded that the proportion of patients who has high distress (57%), moderate distress (25%) followed by no distress (18%). It also concludes that the proportion of patients who has less self-care activity score (81.1%) followed by patients having high self-care activity score (18.9). This is significantly confirmed by the results obtained from the scoring in DDS-17 questionnaire and SDSCA questionnaire. The result from the study reassures the importance of self-care activity in patients with type-2 diabetes mellitus and especially in diabetes related distress conditions. Self-care activities improves patients quality of life and is demonstrated by the score improvement in all 5 sub-domains of SDSCA and scores obtained from DDS-17 questionnaire. Age and self-care status found to be major triggers from the study as majority of study subjects belong to ages falling within 4^{th} and 5^{th} decades of life and self-care activities followed in daily life. The study also found that male subjects (54%) were more effected with type-2 diabetes mellitus than female subjects. For better quality of life in diabetes related distress it is important that patients have a good knowledge about the risk factors and its complications if untreated. Hence appropriate and effective patient counselling/education must be given regarding disease, causes, treatment options and also their quality of life.

ACKNOWLEDGEMENT

First and foremost we thank and humbly submit our dissertation in to the hands of Almighty, for his divine grace and blessings in making this work possible. Without the grace and blessings of God almighty, we would not have been able to complete our thesis work successfully. We wish to express our sincere gratitude to the Principal, guide and staff, The Oxford College of Pharmacy, HOD and doctors of the Oxford medical college, hospital and research centre, Bengaluru for providing the facility to complete our research and for the constant support and co-operation.

Conflict of Interest

The authors declare that there is no conflict of interest.

Funding Support

The authors declare that they have no funding support for this study.

REFERENCES

[1] Aljuaid MO, et al. Diabetes-related distress assessment among type 2 diabetes patients.

Journal of diabetes research. 2018;.

[2] Rehan S, et al. Diabetes self care and diabetic distress in patients with type 2 diabetes. 2015;6(1).

[3] Olokoba AB, et al. Type 2 diabetes mellitus: a review of current trends. Oman medical journal. 2012;27(4):269.

[4] Akhtar SN, et al. of diagnosed diabetes and associated risk factors: Evidence from the large-scale surveys in India. J Soc Health Diabetes. 2017;5(1):28–36.

[5] Kupsal K, et al. Metformin combinational therapy for type 2 diabetes mellitus. J Met Syndr. 2016;5(3).

Cite this article: Parthasarathy G, Freshil Francis, Mahashakti Yadav, Sadasivam Harish Kumar, Vinay N. **Pharmacist Participation in Diabetes-Related Distress Assessment and Role of Self Management Among Type-2 Diabetes Mellitus Patients in a Tertiary Care Hospital**. Int. J Pharm. Res. Life Sci. 2023; 11(1): 16-25.