INFLUENCE OF EDUCATION ON QUALITY OF LIFE IN TYPE 2 DIABETIC PATIENTS IN A TERTIARY CARE TEACHING HOSPITAL

Siddartha Kaskurthy1*, Hema Latha Nalluri1, Dilli Ram Thanait1, Shashidhar2, Rabbani SI1

1 Department of Pharmacy Practice, Krupanidhi College of Pharmacy, Bangalore-560035, India.
2 Department of General Medicine, MVJ Medical College and Research Institute, Hoskote, Bangalore-562114, India.

ABSTRACT

Objective: The purpose of this study was to evaluate quality of life (QoL) in Type 2 diabetic patients treated with insulin and oral hypoglycemic agents (OHA) and to estimate independent QoL by demographic characteristics, complications and co-morbidities.

Materials and Methods: A prospective study was conducted and evaluation of the parameters for QoL was based on SF-36 questionnaire. Patients were divided into two groups based on route of administration of anti diabetic as Insulin and OHA group. Both the groups received diabetes education, instructions on lifestyle modifications, dietary regulations and follow up. The data was recorded, analyzed and compared to find the QoL in two groups of patients before and after diabetic education.

Results: Maximum number of diabetic patients were on OHA (44.7%) followed by combination of insulin and OHA (35.2%) and only insulin (20.1%). The results showed improvement in the Knowledge and Practice scores after patient counseling. Assessment of SF 36 scores showed that there was statistically significant improvement in the QoL scores of patients at each follow up (p< 0.05) compared to baseline.
Conclusion: Clinical pharmacist mediated counseling to type 2 diabetes patients significantly improved the QoL of patients. The data suggests that hospital based pharmacist’s counseling can play an important role in the multi-disciplinary healthcare team.

KEYWORDS
Diabetes mellitus, SF-36 questionnaire, oral hypoglycemic agent, quality of life.

INTRODUCTION
Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia; is associated with abnormalities in carbohydrate, fat and protein metabolism; and results in chronic complications including micro-vascular, macro-vascular and neuropathic disorders.[1]

The risk factors associated with diabetes include obesity, age, lack of physical activity and genetic predisposition. Global burden of diabetes is approximately 382 million people suffering between the age 40 and 59, and 80% of them are living in low- and middle-income countries. The number of people with type 2 diabetes will increase to 55% by 2035. [2]

Co-existence of diabetes with other complications such as Cardiovascular disease leads to a significant increase in clinical manifestations and thus to a substantial decrease in the patients’ QoL. QoL of patients with diabetes is an important factor in analyzing the effectiveness of medical and other care. [3] QoL is a ubiquitous concept that has different philosophical, political and health-related definitions.

It is known that diabetes is a well-established disease which impacts health related QoL. Since the disease is primarily self-managed and self-management regimens affect virtually all aspects of daily life while patients often experience no diabetes-related symptoms for many years, the major burden is often the treatment, not the disease. One of the ultimate goals in the treatment for patients with diabetes is to enhance their HRQoL, which may in turn also improve their disease status. [4]

A diabetes-specific measure, such as Medical Outcomes Study 36-Item Short Form questionnaire encompassing 8 domains—physical functioning, social functioning, mental health, role limitations due to physical problems, role limitations due to emotional problems, vitality (energy and fatigue), bodily pain, and general health perceptions—each of which is scored separately from 0 (worst) to 100 (best). So scores above 50 are better than the general population average for all scales and summary measures, while scores below 50 are worse. [5]
Effective management of diabetes mellitus consists of controlled diet, exercise, other lifestyle modifications and drug therapy. To achieve the therapeutic goals, it is necessary that patients take part in their own therapy, understand their disease and its management carefully and implement it into practice.\textsuperscript{[6]} Studies have shown that increasing patient knowledge regarding disease, its management and its complications has significant benefits with regards to patient compliance and reduction of complications.\textsuperscript{[7]} But there is need for active patient involvement for the successful care of diabetes mellitus.

Hence this prospective study was planned to evaluate the QoL in diabetic treated with insulin and OHA to assess the influence of education on the QoL in diabetics.

**MATERIALS AND METHODS**

This prospective study was carried at Medicine In-Patient Department (IPD) of MVJ Medical College and Research Hospital (MVJ MC & RH) Bangalore, which is a 900 bed tertiary care hospital. It is a prospective- observational study was carried from January 2014 to June 2014. Patients suffering from type 2 diabetes were selected based on inclusion and exclusion criteria. A prior written consent was obtained from patients and the study was conducted after the approval from the human ethics committee of MVJ MC & RH (MVJMC&RH/Research/001/2014-15)

**Patient Data Collection Form (PDCF)**

A suitably designed patient data collection form was prepared in consultation with the physicians and clinical pharmacist and also by referring standard textbooks and journals. It included information of patient demographic details such as age, gender, past medical history, social habits of smoking and alcohol, presenting complaints, current medications, diagnosis, laboratory results and contact details.

**Medical outcomes (MOS SF-36) questionnaire**

SF-36 is one of the most widely used general HRQoL measures and is considered to be the most relevant to the diabetes population. As a part of the parent study administered the MOS SF-36 during the baseline evaluation of subjects. This instrument consists of eight subscales that use 4-week recall to assess different dimensions of HRQoL. The subscales are: Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role-Emotional (RE), and Mental Health (MH). The instrument yields eight subscale transformed scores, each ranging from 0-100 with higher scores
indicating better QoL. The mean of valid responses was used to substitute for missing values for up to 50% of the items in each subscale. If more than 50% of the items were missing, the subscale score was considered to be missing. To facilitate interpretation and comparison to population data, the subscale scores were transformed to normal scores, which have a mean of 50 and standard deviations of 10 based on the 1998 general U.S. population. Two summary scores, physical function and mental function, can also be derived from the subscale scores.

**Study Procedure**

All the data regarding demographics, treatment, co-morbidities and complications were collected from patient’s case sheet. QoL of the patients was measured using SF-36 health survey questionnaire and clinical pharmacist asked each question in easily understandable language and the answer given by patient was noted in the questionnaire by the clinical pharmacist. After this patients were counselled regarding various aspects of diabetes like:

1. What is diabetes, types of diabetes mellitus and its causes?
2. Risk factors associated with diabetes mellitus, signs and symptoms of hyperglycaemia, hypoglycaemia, method to overcome hypoglycaemia, other complications of untreated diabetes mellitus
3. Management goals of diabetes mellitus and target goals for blood sugar levels, lipids
4. Non-pharmacological treatment of diabetes mellitus like diet and physical exercise

Patients were also advised for regular monitoring of physical and laboratory parameters like blood glucose levels, blood pressure, eye check-up, foot examination, and lipid profile. The patients were explained about dietary and its benefits.

After discharge, follow up of patients was done at the interval of one month via, revisit, community network and telephone interaction and outcome was assessed by patients understanding about their disease. QoL of the patients was reassessed by using SF-36 questionnaire. Patients were again counselled regarding their disease status, medication and life style modifications, after an interval of one month patients were followed by the same procedure to determine their understanding about their disease and medications and life style modifications and outcome was assessed by using SF-36 questionnaire to determine QoL of the patients.
statistical analysis
The data collected was analyzed by one way analysis of variance (ANOVA) to compare the level of significance among different groups. The level of significance was $P < 0.05$.

RESULTS
A total of 85 patients had complete data on all variables and were included in these analyses. Table 1 presents the impact of socio demographic characteristics, complications, co morbidities and medical history variables on quality of life.

Table No: 1) Demographic Details of the Patients

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>NO.OF PATIENTS</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MALE</td>
<td>56</td>
<td>65.88%</td>
</tr>
<tr>
<td>FEMALE</td>
<td>29</td>
<td>34.11%</td>
</tr>
<tr>
<td>AGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 35 years</td>
<td>5</td>
<td>5.88%</td>
</tr>
<tr>
<td>35-49 years</td>
<td>11</td>
<td>12.94%</td>
</tr>
<tr>
<td>50-64 years</td>
<td>15</td>
<td>17.64%</td>
</tr>
<tr>
<td>&gt;65 years</td>
<td>54</td>
<td>63.52%</td>
</tr>
<tr>
<td>SOCIAL HABITS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALCOHOL INTAKE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>27</td>
<td>31.76%</td>
</tr>
<tr>
<td>NO</td>
<td>58</td>
<td>68.23%</td>
</tr>
<tr>
<td>SMOKING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>24</td>
<td>28.23%</td>
</tr>
<tr>
<td>NO</td>
<td>61</td>
<td>71.76%</td>
</tr>
<tr>
<td>YEARS SINCE DIAGNOSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2years</td>
<td>19</td>
<td>22.35%</td>
</tr>
<tr>
<td>2-5 years</td>
<td>32</td>
<td>37.64%</td>
</tr>
<tr>
<td>6-10 years</td>
<td>22</td>
<td>25.88%</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>12</td>
<td>14.11%</td>
</tr>
</tbody>
</table>

On the assessment of SF-36 questionnaire QoL scores are $P < 0.05$ level significant. Patients aged $<49$ years had significantly higher scores than did those who were older on physical functioning scale. In addition, those aged 50-64 years had significantly higher scores than those aged $>65$ years. Males (65.88%) reported significantly higher QoL than did females (34.11%) on QoL dimensions. In general, younger persons reported less impairment in physical and social functioning and greater impairment in mental health. Most patients in the study had no habit of smoking and alcohol consumption, only 17.65% patients were smokers.
and 31.8% patients are alcoholic. Twenty seven patients had the history of diagnosis with diabetes mellitus since 2-5 years, while 19 patients were diagnosed with type 2 diabetes mellitus since 6-10 years. Sixteen patients were diagnosed with type 2 diabetes mellitus since < 2 years, whereas 11 patients were diagnosed from >10 years. Patients with long duration of disease are at a higher risk of developing complications (table 1).

Most patients had co-morbidities like Cardiovascular disease and other micro vascular complications. It is known that most patients of diabetes suffer from one or more complications. Some of the major complications observed in this study like 24.70% peripheral neuropathy, 10.58% nephropathy, 9.41% Cardiovascular disease and 4.70% Retinopathy. Fig. 1

![Complications presents in the Patients](image1)

**Figure 1: Complications present in Patients**

The patients had hypertension 18.82%, dyslipidemia 20.2% alcoholic liver disease 4.70%, chronic obstructive pulmonary disease 7.05%, chronic kidney disease and 31.76% patients had no co-morbidities. Fig. 2

![Co-morbidities in Patients](image2)
Figure 2: Co-morbidities present in Patients
The SF 36 scores for study participants of type 2 diabetic individuals taking insulin reported lower quality of life on the physical- and mental-functioning scales than did other patient subgroups such as 44.7% OHA, 20.2% insulin 35.2% both OHA & insulin. Fig. 3

Figure 3: ORAL, INSULIN and BOTH ORAL and INSULIN treated patients

DISCUSSIONS
Diabetes mellitus is a chronic disease, health and illness affect self concept due to the duration and severity of chronic diseases such as diabetes, physical function, psychological, social and economic quality of life is undergoing enormous changes. In addition, health problems, negative effects on their self concept, and the patient need help to accept the changes in the status and quality of life. [8]

In our study 100 patients diagnosed with diabetes mellitus were enrolled, out of which 85 completed the study successfully, 15 patients could not be followed up due to various reasons like patient is out of station, negative attitude towards counseling and inability to contact through phone.

The data representing the gender wise distribution indicated that the maximum patients were males. A study had shown the incidence of type 2 diabetes mellitus is higher in males. This could be because of higher number of associated risk factors present in males. [9] More than
half of the patients were above the age of 50 years and the mean age was 55 years. According to WHO’s estimates of global prevalence of diabetes, the majority of patients with diabetes are in range of 45-64 years. \cite{10,11} thus our study shows similar trend in age-wise distribution.

Among social habits like smoking and drinking was observed to most common among diabetic patients. But more than half of the patients were no habit of smoking and drinking alcohol only few were reported. In a study there are evidences which show that smoking cessation decreases risk of cardiovascular disease, cancer, and stroke and lung disease. \cite{12} in another study had shown that counseling for diabetes smokers to quit smoking can at least encourage patients and they might attempt to quit smoking. \cite{13} In our counseling too we encouraged the patient to quit smoking and alcohol consumption and had a positive effect in the management of disease. But moderate alcohol intake may be Associated with less complications and drinking alcohol heavily are advised to reduce their alcohol intake. \cite{14} It is necessary to determine the duration of diabetes since patients are diagnosed with type 2 diabetes mellitus as it might affect the knowledge and attitude of the patients towards diabetes management. Most of the patients had the history of diagnosis with diabetes mellitus since 2-10 years, only few patients were newly detected. Patients with long duration of disease are at a higher risk of developing complications. \cite{15}

Most patients had co-morbidities like cardiovascular disease, Hypertension, Dyslipidemia, ALD, COPD, and CKD. Only few patients had no co-morbidities. Most of the co-morbidities present may be attributed to the uncontrolled blood glucose. Half of the patients had no complications, but most of the patients had complications like peripheral neuropathy, Nephropathy, CVD, Retinopathy. Most complications can be reduce by managing high blood glucose levels with lifestyle modifications (e.g. frequent checkup, Reducing the high cholesterol diet, reducing salt intake, regular exercise etc.) Hence this is a green area where as clinical pharmacist with his skills and knowledge can counsel the patients and help them to achieve goal.

In our study more than half of the patients received OHA, and both OHA & insulin only few received insulin. The result slightly differs from other study in which 75\% patients were on OHA, 20\% patients were on combination of Insulin and OHA and 04\% patients were on only Insulin. \cite{16} The reason for deviation could be the nature of disease. Since most patients chronic diabetes it necessitates the use of Insulin with OHA.
On assessment of QoL it was found that both physical component scores (PCS) as well as mental component scores (MCS) were affected by diabetes. But after counselling by pharmacist there were changes in the mean PCS and MCS scores which were statistically significant (p <0.05) in the QoL of the patients in test group and there was strong co-relation between the blood glucose levels and quality of life of the patient. In another study showed that pharmacist provided patient counselling had impact on glycaemic control and overall QoL in diabetic patients. [17]

Impact of creating awareness and providing patient counselling was assessed using SF 36 questionnaire, which was answered by the patients. Results showed that more number of patients preferred patient counselling and found useful for maintaining their diabetes condition. From this study shows the emergence of whole new concept of diabetes counselling, whereby pharmacists can provide counselling to the patients and to help improve the disease state.

CONCLUSION

The results of the study showed a significant enhancement in the quality of life of the patients following pharmacist’s mediated patient counselling since there was an improvement in QoL scores from first follow-up compared to baseline scores. Further the assessment of the quality of life of diabetic patients in both oral and insulin groups indicated a negative influence on co-morbidities especially hypertension, dyslipidemia. The observations suggest that clinical pharmacist can play an important role in the multi-disciplinary healthcare team in enhancing the Quality of life and clinical outcome of the disease.

ACKNOWLEDGMENT

The Authors wish to thank the management, principal and staff of Krupanidhi College of Pharmacy, Bangalore and MVJ Medical and Research Hospital, Bangalore for extending for their timely support to complete this work.

REFERENCES


