WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 8, 305-318. Review Article ISSN 2277–7105

A PHARMACIST'S ROLE AND RESPONSIBILITIES IN PATIENT COUNSELING ON DIABETES MANAGEMENT

Ketaki S. Shinde*[1], Shubhangi A. Patil[1], Niranjan D. Chivate[1] and Akshay R. Yadav[1]

[1]Department of Quality Assurance, Krishna College of Pharmacy, Karad, India.

[1]Department of Pharmacology, Krishna College of Pharmacy, Karad, India.

Article Received on
22 February 2025,

Revised on 14 March 2025,
Accepted on 02 April 2025

DOI: 10.20959/wjpr20258-36221

***Corresponding Author**
Ketaki S. Shinde
Department of Quality Assurance, Krishna college of Pharmacy, Karad, India.

ABSTRACT

Over the past three decades, pharmacists have shifted their focus to patient-oriented counseling, providing patients with information on their disease, medications, and lifestyle modifications. This approach has been shown to improve therapeutic outcomes and patient compliance. Diabetes mellitus, a metabolic disorder characterized by hyperglycemia and abnormalities in carbohydrate, fat, and protein metabolism, requires self-management and adherence to prescribed medication and lifestyle modifications. Pharmacists play a crucial role in counseling, addressing both non-pharmacological and pharmacological measures, and providing education on acute and chronic complications. This approach has been shown to enhance patient compliance and improve the quality of life outcomes in diabetes patients.

KEYWORDS: Counseling, diabetes mellitus, patient compliance.

INTRODUCTION

Over the last three decades, the job of the pharmacist has evolved substantially. Traditionally, pharmacists were thought to be people who provided medicine to the general populace. This function gradually evolved into one that involves more medication development. The late 1960s saw the emergence of a new development known as clinical pharmacy, which transformed the notion of pharmacy from a product-oriented to a patient-focused one. Pharmacists are increasingly important in monitoring patient medication treatment.1 The clinical pharmacy evolved from the notion of pharmaceutical care, which is the responsible

supply of medication therapy with the goal of accomplishing certain goals that improve patients' quality of life.

It entails the pharmacist's choice to avoid, commence, maintain, or stop prescription and non-prescription medication therapy. As a result, it is carried out in conjunction with patients, physicians, nurses, and other health-care staff. The ultimate objective of pharmacological treatment is to improve the quality of life of patients. These objectives can be attained through influencing illness cure, symptom elimination or reduction, disease arrest or slowdown, disease prevention and diagnostics, or desirable adjustments in the physiological process.

Patient counseling is a crucial component of pharmacological care. It is described as offering medication-related information to patients or their representatives, either verbally or in writing, on issues such as dosage instructions, adverse effect advice, precautions, storage, diet and lifestyle changes.3 Patient counseling is an interactive process that entails a one-on-one discussion between a pharmacist and a patient or caregiver. It should include an evaluation of whether the material was received correctly and if the patient knows how to apply the knowledge to increase the likelihood of beneficial therapy results.

The ultimate objective of counseling is to provide knowledge aimed at promoting safe and proper pharmaceutical usage, hence improving therapeutic results. Several recommendations outline the topics that the pharmacist must address while advising patients.

DIABETES MELLITUS

Diabetes mellitus (DM) is a heterogenous metabolic disorder characterized by the presence of hyperglycemia with carbohydrate, protein and fat metabolism disturbance which results from defects in either insulin secretion or action. Patients with DM usually present with polyuria, polydipsia and unexplained weight loss. Type 1 DM is caused by beta cell destruction which leads to complete insulin deficiency. It may be immune mediated or idiopathic. Patients may present with ketoacidosis or acute onset of hyperglycemia while other patients may resemble type 2 DM or symptoms of other autoimmune disorders. Type 2 DM is the most common form of diabetes. It is secondary to defect in insulin secretion concomitant with insulin resistance.

Majority of patients are asymptomatic. Ketoacidosis is uncommon and is usually secondary to stress (eg infection).

Patient Education

- Patients with pre-diabetes should be informed of their increased diabetes mellitus and cardiovascular disease risk, and should be counseled about effective ways to lower their risk.
- Interventions and follow-up should be most vigilant in patients with HbA1c >6%, who are considered to be at very high risk for developing diabetes.
- Annual monitoring for the development of diabetes mellitus is advised.
- Counsel women of reproductive age regarding contraception and measures to avoid fetal exposure to harmful medications.

Diabetes Self-Management Education and Support (DSMES)

- Should be offered to all individuals with type 2 diabetes mellitus.
- A skills-based approach focusing on how to help patients with diabetes to make informed self-management choices.
- An unending process that incorporates the needs, goals and life experiences of patients with diabetes mellitus which facilitates knowledge, decision-making, skill and ability that they need for self-care.
- Given to patients with diabetes at the time of diagnosis, anually for assessment of education, nutrition and emotional needs, if there are new complicating factors affecting self-management, changes in health or social status, and if there is transition in care or life situation.
- Helps patients with diabetes to initiate useful self-management and cope with diabetes mellitus as soon as they are diagnosed.
- Aids patient to optimize metabolic control, prevent and manage complications, and maximize quality of life in a cost-effective way.
- Includes medical nutrition therapy, physical activities, weight management, sufficient sleep, preventing smoking, limiting alcohol consumption, counseling on substance abuse and reducing stress on psychosocial issues through psychological support.
- Key results are effective self-management and quality of life.
- Studies have shown that diabetes self-management education improved diabetes knowledge and self-care behavior, improved clinical (eg lower HbA1c) and psychological

results, reduced weight, decreased hospitalization and all-cause mortality, and improved quality of life at lower cost.

- It has been found that better HbA1c reduction is achieved when there is more contact time between the patient with diabetes mellitus and the educator.

Motivational Counseling

- Counseling approach that incorporates motivational interviewing as part of a structured lifestyle intervention has been found to have beneficial effects in diabetes management
- Evidences show a higher weight loss and maintenance of weight loss when motivational interviewing was used in weight loss program for type 2 diabetes mellitus.
- The Decision Balance Technique is often used in motivational counseling and seeks to clarify issues about change, lower resistance and enhance motivation to change using knowledge and experiences of the patient.

Lifestyle Modification

Medical Nutrition Therapy (MNT)

- Focuses on how to improve metabolic outcomes of diabetes mellitus by modifying nutrient intake and lifestyle.
- Important in preventing and managing hyperglycemia and preventing, delaying and treating diabetic complications.
- In patients with pre-diabetes, medical nutrition therapy may help lower diabetes mellitus and cardiovascular disease risk by promoting healthy food choices and physical activity which will lead to moderate weight loss that is sustained.
- In patients with diabetes mellitus, medical nutrition therapy will help reach and maintain blood glucose, blood pressure and lipid profile levels as close to normal.
- Deals with individual nutritional needs based on personal and cultural preferences, severity of disease, and patient's readiness for change.
- Maintains eating pleasure by only restricting food choices that are necessary for metabolic control.
- In patients with diabetes mellitus treated with Insulin or insulin secretagogues, medical nutrition therapy provides self-management training for safe performance of exercise, preventing and treating hypoglycemia, and managing acute hyperglycemia.
- Adjustment of insulin dose should match carbohydrate intake with specific reference to sucrose-containing or high glycemic index food.

- Studies had shown that after 3-6 months of medical nutrition therapy, HbA1c is decreased by 1% in type 1 diabetes mellitus and 1-2% in type 2 diabetes mellitus and LDL-C reduced by 15-25 mg/dL (0.4-0.6 mmol/L).
- There is no recommendation on nutrition that can prevent type 1 diabetes mellitus.

Diet

- The cornerstone of diabetes mellitus management.
- Advise patients to avoid missing meals and it should be synchronized with time actions of the medication.
- A balanced diet is recommended.
- Individualized based on glucose and lipid targets.
- For digestible carbohydrate, the recommended dietary allowance (RDA) is 130 g/day and is based on providing adequate glucose
- Lower fat intake, especially saturated fat, may decrease diabetes mellitus risk by producing an energy-dependent improvement in insulin resistance and promoting weight loss.

Calories

- Total calories (amount/day) must be calculated based on patient's needs.
- Studies suggest that for patients with diabetes, there is no ideal percentage of calories from carbohydrates, protein and fat.
- Macronutrient distribution should be individualized based on metabolic goals, current eating patterns and preferences.

Carbohydrate

- Amount and type of carbohydrate ingested determine the postprandial response
- Should be obtained from fruits, vegetables, whole grains, legumes and low-fat milk
- Glycemic index (GI) may be used in guiding choices of food and provides benefit in altering postprandial response.
- Ranked on a scale of 0-100, it is a measure to classify carbohydrate based on its effect on the blood glucose level.
- Food with high GI value (≥70) raises blood glucose more rapidly than food with medium (56-69) or low (≤55) GI.
- Total intake of carbohydrate should be consistent and equally distributed throughout the day.

- Monitor total daily intake of carbohydrate to achieve glycemic control Should match carbohydrate content of meal to doses of Insulin and insulin secretagogues.
- Resistant-starch/high-amylose foods.
  - Eg legumes, raw potato, formulated cornstarch
  - May alter postprandial glycemic response, prevent hypoglycemia and decrease hyperglycemia; however, no long-term studies have shown benefit from using resistant-starch in patients with diabetes mellitus
- Sweeteners
  - Sucrose may substitute for other carbohydrate sources in the meal plan (up to 10% of total daily energy intake).
  - Sucrose intake is counted as part of the total carbohydrate intake; ensure blood glucose, lipids and body weight are adequately controlled.
  - Naturally occurring fructose in fruits, vegetables and other foods may be used which only accounts for 3-4% of energy intake.
  - Artificial sweeteners (eg acesulfame K, aspartame, neotame, saccharin, sucralose) and sugar alcohols (eg erythritol, isomalt, lactitol, maltitol, mannitol, sorbitol, isomalt, xylitol, tagatose, hydrogenated starch hydrolysates) may be used within daily intake levels.
    - Sugar alcohols have lower available energy (2 cal/g) and produce a lower postprandial glucose response than sucrose or glucose.
    - Sugar alcohols lower the risk of having dental caries but have no evidence in decreasing blood sugar, energy intake, or weight.

Fiber

- Because of the general health benefits of fiber, individuals with diabetes mellitus are encouraged to increase intake to 14 g fiber/1000 kcal/day or approximately 38 g/day for men and 25 g/day for women.
- 5-7 servings or 20-30 g of fiber/day is recommended.
  - Eg vegetables, fruits, legumes, whole grain products and fiber-rich cereals (≥5 g fiber/serving).
  - Dietary fiber and whole grain-containing foods are associated with better insulin sensitivity and ability to secrete insulin sufficiently to overcome insulin resistance.

Dietary Fat and Cholesterol

- There is a lack of evidence to recommend an ideal amount of total fat intake for patients with diabetes.
- As recommended for the general public, an increase in foods rich in n-3 linolenic acid and long-chain n-3 fatty acids (EPA, DHA) is also recommended to patients with diabetes.
- In individuals with type 2 diabetes mellitus, a Mediterranean-style, monounsaturated and polyunsaturated fatty acid-rich diet may be recommended as an effective alternative to a higher carbohydrate, lower-fat eating pattern since these may benefit cardiovascular disease risk factor and glycemic control.
- In type 2 diabetes mellitus, the recommended amount of dietary saturated fat, trans fat and cholesterol is the same as that for the general public.

Protein

- Good-quality protein (eg meat, poultry, fish, eggs, milk, cheese, soy) has high protein digestibility-corrected amino acid scoring pattern (PD-CAAS) scores and supplies all 9 indispensable amino acids.
  - PD-CAAS is the preferred method by Food and Agricultural Organization of the United Nations/World Health Organization (FAO/WHO) in the measurement of protein value in human nutrition as it has a more accurate characterization of the protein quality of foods.
  - A food can be considered as good quality source of protein if the corrected protein level is ≥10% of the daily value per reference amount customarily consumed
- Should not be used for the treatment of acute or for the prevention of nocturnal hypoglycemia since protein increases insulin response without increasing plasma glucose concentrations.

Alcohol

- Limit to ≤1 drink/day for women and ≤2 drinks/day for men to reduce diabetes mellitus, coronary heart disease and stroke risk.
  - 1 alcohol-containing beverage is defined as 12 oz beer, 5 oz glass of wine or 1.5 oz distilled spirits which contains 15 g of alcohol.
  - All types of alcohol-containing beverage have similar effects.
- In patients using insulin or insulin secretagogues, alcohol should be consumed with food to lower risk of nocturnal hypoglycemia.
- May increase blood glucose level when taken with carbohydrate.

Micronutrient

- There is insufficient evidence of benefit from mineral or vitamin supplementation in patients with diabetes who do not have underlying deficiencies.

Sodium

- Na intake should be limited to <2300 mg/day as per recommendation to the general public Should avoid foods high in sodium (eg soy sauce or other sauces, pre-mixed cooking paste, preserved and processed foods) and salt in cooking should be limited to ¼-½ teaspoonful/day.
- For patients with both hypertension and diabetes, further reduction in sodium intake should be individualized.

Physical Activity

- Regular aerobic exercise improves blood glucose control, lowers cardiovascular disease risk factors, contributes to weight loss, decreases the risk of falls and fractures, improves quality of life by improving functional capacity and sense of well-being and prevents the development of type 2 diabetes mellitus in individuals who are at high risk.
  - At least 8 weeks of exercise intervention has been shown to reduce HbA1c by 0.66% in patients with type 2 diabetes mellitus
- It is recommended that patients with diabetes have at least 150 minutes/week of moderate-intensity exercise spread over at least 3 days/week with no >2 consecutive days without exercise.
  - Twice-thrice weekly resistance, flexibility and/or balance training, if without contraindications, is recommended.
- Vigorous activity is not recommended in patients with ketosis.
  - Can worsen hyperglycemia of patients with diabetes mellitus type 1 who have not received insulin for 12-48 hours or are ketotic.
- In patients on insulin or insulin secretagogues, it is advisable to take extra carbohydrate before exercise if pre-exercise glucose levels are <5.0 mmol/L (<90 mg/dL).
  - Physical activity can cause hypoglycemia if medication dose or carbohydrate consumption is not adjusted in patients taking insulin or insulin secretagogues.
- Should assess patient for certain exercises that might be contraindicated to their condition (ie uncontrolled hypertension, severe autonomic neuropathy, history of foot lesions, unstable proliferative retinopathy).

- High-risk patients should be advised to start with low-intensity exercise at short periods and then slowly increase the intensity and duration.
- Vigorous aerobic or resistance exercise should be avoided by patients with proliferative or severe no proliferative diabetic retinopathy due to possible risk of vitreous hemorrhage or retinal detachment.
- Proper footwear should be advised in all patients with peripheral neuropathy, and those patients with foot injury should be restricted to no weight-bearing activities
- Cardiac investigation should be done in patients with diabetic autonomic neuropathy before starting any intense physical activity since autonomic neuropathy is strongly associated with cardiovascular disease in diabetic patients
- There are no exercise restrictions in patients with diabetic kidney disease but they should be reminded that physical activity can acutely increase urinary protein excretion.

- Moderate-intensity and vigorous exercise may improve insulin sensitivity and reduce risk for type 2 diabetes mellitus.
- Evidence has shown that breaking bouts of sedentary activity every 30 minutes by briefly standing or walking may help prevent type 2 diabetes mellitus for those who are at risk and may aid in the glycemic control in those with diabetes mellitus.

Weight Management

- A ≥5% weight loss from initial body weight over a 6-month period is advised in all individuals who are overweight or obese who have or are at risk of diabetes mellitus which can be achieved by a lower calorie intake (20-25 kcal/kg body weight), lower dietary fat intake, at least 150 minutes/week physical activity and behavioral modification
- In Asians, waist circumference ≥31 inches (≥80 cm) in women and ≥35 inches (≥90 cm) in men, and BMI >23 kg/m^2 are at high risk for type 2 diabetes mellitus and cardiovascular disease.
- Moderate weight loss leads to decreased insulin resistance, improved blood sugar and lipid levels, and lower blood pressure.
- A low-carbohydrate or a low-calorie meal plan with meal replacements and the Mediterranean diet can be used safely and effectively in the short term (1-2 years) to achieve weight loss.
- Lipid profiles, renal function, and protein intake should be monitored in patients on low-carbohydrate diet, and antidiabetic therapy must be adjusted.

- Weight loss medications may be advised in overweight or obese patients with type 2 diabetes mellitus.
  - Please see Obesity disease management chart for further information
- Metabolic/bariatric surgery is effective in improving glucose control and often results in disease remission; it is recommended in individuals with type 2 diabetes mellitus who have a BMI:
  - ≥40 kg/m^2 (≥37.5 kg/m^2 in patients with Asian ancestry) or
  - 35-39.9 kg/m^2 (32.5-37.4 kg/m^2 in patients with Asian ancestry) who failed to have durable weight loss and improvement in comorbidities with reasonable non-surgical methods.

Sleep

- All patients should be advised to sleep approximately 7 hours per night to maintain energy levels and well-being.
- Evidence supports that 6-9 hours of sleep per night is associated with a decrease in cardiometabolic risk factors.
- Sleep deprivation causes aggravation of insulin resistance, hypertension, hyperglycemia and dyslipidemia and increases inflammatory cytokines.

Behavioral Support

- Patients with diabetes mellitus are encouraged to join community groups that promote healthy lifestyle for emotional support and motivation.
- There are high rates of anxiety and depression in patients with diabetes mellitus and obesity that can adversely affect outcomes.
- Cognitive behavioral therapy was found to be beneficial.

Smoking Cessation

- It has been found that smoking may have a role in the development of type 2 diabetes mellitus.
- For patients having difficulty with smoking cessation, nicotine replacement therapy should be considered.
- For more recalcitrant patients that cannot stop smoking on their own, structured programs are recommended.

Importance of Counselling in Diabetes Management

- Research evidence confirms the existence of close links between positive psychological adjustment and wellbeing and good management of diabetes. The development of psychosocial support, therefore, is essential and should be built into routine care from the onset.

- It is important to note that individuals vary widely in their psychological responses to events. Although they share some commonalities, each person's experience is unique the diagnosis of diabetes can have a tremendous emotional impact on the person diagnosed and their family.

- The link between diabetes and depression is well documented. Another area of concern is the growing number of documented cases of eating disorders among individuals with diabetes. Whether these problems are more, less, or equally prevalent in diabetes compared to the general population remains controversial. Regardless, eating disorders are clinically important because of their association with poor glycemic control and an increased risk for retinopathy. Eating disorders can be effectively treated with psychotherapy.

- One in four people will experience depression at some time in their adult life. For people who live with diabetes this figure is even higher. Research shows that having diabetes more than doubles the risk of developing depression. Living with this sort of chronic disease and having to cope with biological and hormonal factors and the treatment regime on a daily basis may increase the risk of depression.

Other related emotional issues include

- Adjustment to the diagnosis and life transition
- Concerns about not being able to stick with your diabetes care plan
- Dealing with complications of diabetes
- Work and family stress
- Marital and relationship issues
- Family adjustment
- Childs school difficulties or behavior problems.
- Being diagnosed and living with diabetes can affect people in very different ways. While some may find coping with diabetes has very little impact on day-to-day life, others may

find that it has turned their lives upside down. They may neglect their diet, stop monitoring glucose levels, or revert to unhealthy habits.

- The physical impact of diabetes is well reported but the emotional impact is still not always recognized. When people are diagnosed with diabetes, their confidence, self-esteem and sense of being in control may be challenged. Emotions at diagnosis vary but may include shock, denial, sadness, frustration, guilt, fear, anxiety, anger or even relief.

Role of Counselling

- A diagnosis of diabetes is a life-changing event. It is a time when families can often struggle to adapt to the "new type of normal" they must face. Psychological counselling during this time can be of great benefit to all those involved.
- In past decades clinicians have increasingly recognized the importance of psychological support for people with diabetes and their families, and many have recommended integrating psychological counselling into routine diabetes care. It is therefore important to consider whether psychological interventions in diabetes are effective in improving clinical outcomes.
- It is widely acknowledged that a person's emotions, beliefs and self-esteem have an impact upon the way that he/she thinks and behaves.
- Through counselling, one can help clients to acknowledge and share the emotional challenges raised by diabetes. They are able to create a space in which clients may freely discuss how they feel about themselves and their diabetes.
- The counsellor can employ motivational interviewing as a technique for identifying and setting realistic goals, maximizing the client's experience of success as each goal is accomplished. Individuals are supported and encouraged to anticipate potential problems and to identify potential stressors. We know that change can create stress, so anticipating change and discussing potential areas of difficulty and their solutions can reduce the impact of a stressful event. Counselling also offers the opportunity to share techniques in stress reduction such as progressive relaxation and positive visualization.
- By using some of the methods of cognitive behavioral therapy (CBT) counsellors facilitate, examine and modify negative thoughts or beliefs, thus improving self-esteem. At the same time, other psychosocial issues outside diabetes which may affect a person’s ability to cope may be identified and managed. Results indicate that cognitive behavior therapy (CBT) is effective in the treatment of depression in Type 2 diabetes patients, both in reducing depressive symptoms and HbA1c.

- Behavior family therapy proved beneficial in terms of resolving family conflicts, but did not impact glycemic control.

CONCLUSION

Diabetes is a chronic condition that needs both pharmaceutical and non-pharmacological treatments to be properly controlled. Diabetes management relies heavily on patient adherence to treatment regimens and lifestyle changes. Pharmacy professionals have a huge obligation to provide these patients with counseling because they are an integral part of the healthcare system. The pharmacist must keep up with current research and have good verbal and nonverbal communication abilities if he wants to serve as a good counselor.

REFERENCES

1. Heidi M, Harper A and Berger BA et al. Pharmacists predisposition to communicate-Desire to counsel and job satisfaction. Am J Pharm Educ., 1992; 56: 252- 8.
2. Popovich NG. Ambulatory patient care in Gennaro AR editor Remington: The science and practice of pharmacy vol 2. Mack publishing company, Pennsylvania, 19th edition, 1995; 1695- 719.
3. USP medication counseling behaviour guideline. USP DI update volumes I and II Rockville, the United States Pharmacopeia Convention Inc, 1997; 664-75, 1739-48.
4. Beardsley RS. Review of literature: oral patient counseling by pharmacists. Proceedings of the National Symposium on oral counseling by pharmacists about prescription medicines, 1997 Sep 19-21; Lansdowne, Virginia.
5. Dooley M, Lyall H, Galbriath et al. SHPA standards of practice for clinical pharmacy. In: SHPA practice standards and definitions, 1996; 2-11.
6. Omnibus Budget Reconciliation. Act of 1990, Pub. L .no. 101-508, and 4401, 104 stat 1388, 1990.
7. American Diabetes Association. Diabetes facts and figures. Available at: http://diabetes.org/diabetes-statistics.jsp. (Accessed on 27th January 2005).
8. Powers AC. Diabetes mellitus. In: Braunwald, Fauci, Kasper et al 'editors'. Harrison's Principles of Internal Medicine. 15th edition. United States of America: McGraw-Hill, 2001; 2109- 37.
9. Cowie CC, Eberhardt MS, eds. Diabetes 1996: vital statistics. Alexandria, VA, American Diabetes Association, 1996.

10. Kahn SE, Porte D Jr. The pathophysiology of type II (non- insulin dependent) diabetes mellitus: Implications for treatment. In Porte D Jr, Sherwin RS, eds. Ellenberg & Rifkin's Diabetes Mellitus, 5th ed. Stamford, CT, Appleton & Lange, 1997; 487- 512.
11. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: Prevalence, numerical estimates, and projections. Diabetes care, 1998; 21: 1414- 31.
12. Glasgow RE, Anderson RM. In diabetes care, moving from compliance to adherence is not enough: something entirely different is needed. Diabetes Care, 1999; 23: 2090-7.
13. Etzwiler DD. Chronic care: a need in search of a system. Diabetes Educ., 1997; 23: 569- 73.
14. Diabetes control and complication trial group. The effect of intensive treatment of diabetes on the development and progression of long- term complications in insulin-dependent diabetes mellitus. N Engl J Med., 1993; 329: 977- 86.
15. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood- glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS33). Lancet, 1998; 352: 837- 53.