



Barriers to Self-care management among Type 2 Diabetes mellitus patients: A qualitative study

Bhavya A P¹, Divya A P², Gangotri Khairwar³, Achun Rongmei⁴, Arti Soni⁵

¹ Professor, Department of Obstetrics and Gynaecological Nursing, Mitali Institute of Nursing, Madhya Pradesh, India

² Associate Professor, Department of, Community Health Nursing, Mitali Institute of Nursing, Madhya Pradesh, India

³ Professor, Department of, Community Health Nursing, Regional Institute of Nursing, Madhya Pradesh, India

⁴ Assistant Professor, Department of, Paediatric Nursing, Indira Gandhi National Tribal University, Madhya Pradesh, India

⁵ Psychiatric Nursing Officer, Mental Health Nursing, Seth Govind das Victoria Government Hospital, Madhya Pradesh, India

Abstract

Diabetes mellitus is an emerging public health threat with rapid increase in prevalence all over the world. Mortality and other health care costs associated with diabetes are mainly due to its complications rather than the disease itself. Self-care management practices are essential and is a key component in managing DM and preventing complications. Evidence shows that patients with diabetes face several challenges and obstacles in adhering to such practices. The current study aimed to identify the barriers to self-care management in patients with type 2 diabetes. The study was conducted using a thematic analysis method and data were collected through Focus Group Discussions (FGDs) with 25 Type 2 DM patients using semi-structured interview guide in a private room in selected urban primary health centres of Karnataka, South India in the year 2024. The participants were selected using purposive sampling and sampling continued until data saturation. The collected data were analysed with *NVivo* software. Findings revealed wide range of barriers starting from individual perspectives to the social and healthcare system perspective in diabetes management. Firstly, at the individual level, a lack of knowledge, limited resources, non-adherence to medication, and financial constraints were major obstacles. Secondly, insufficient social support and misinformation about alternative treatments also influenced patient behaviour. Thirdly, at the healthcare service level, long waiting times and inadequate social support were identified as challenges. Lastly, limited accessibility due to transportation issues and community resource constraints further hindered self-care. Findings revealed that patients require comprehensive education, easy access to medical tools, and psychological support to manage their condition effectively. Families and communities must be equipped with accurate knowledge about diabetes and trained to support patients. Healthcare providers should improve service quality by adopting a holistic approach and collaborating with communities to ensure optimal care. With collective efforts, it is hoped that the quality of life for diabetes patients can improve, and complications resulting from the disease can be prevented. Designing of interventions that capitalize on how to improve patients' desire to reduce the progression of diabetes and the use of relevant technological devices could enhance diabetes self-management.

Keywords: Type 2 Diabetes mellitus, barriers, self-care management, prevalence, qualitative study

Introduction

Type 2 Diabetes Mellitus is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood glucose. Hyperglycaemia, also called raised blood glucose is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels [1].

In 2022, more than half (59%) of adults aged 30 years and over living with diabetes were not taking medication. Diabetes treatment coverage was lowest in low- and middle-income countries. In 2021, diabetes was the direct cause of 1.6 million deaths and 47% of all deaths due to diabetes occurred before the age of 70 years. Another 5,30,000 kidney disease deaths were caused by diabetes, and high blood glucose causes around 11% of cardiovascular deaths. The number of people living with diabetes rose from 200 million in 1990 to 830 million in 2022. Prevalence has been rising more rapidly in low- and middle-income countries than in high-income countries. More than half of people living with diabetes did not take medication for their diabetes in 2022. [1,2]

Diabetes mellitus is a booming public health issue with rapidly increasing prevalence all over the world. The number of patients with diabetes was 425 million in the

world in 2017; is expected to reach 629 million in 2045. Evidence from literature shows that there are poor adherence practices to medications and other self-care practices [2]. As a result, many of the diabetes end-up with major complications which otherwise are preventable. Self-care practices should be initiated soon after the diagnosis and consistent engagement in such practices are found to have positive outcomes [3]. A healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use are ways to prevent or delay the onset of type 2 diabetes. Diabetes can be treated and its consequences can be avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications.

The term 'self-management' refers to day-to-day activities or actions an individual must undertake to control or reduce the impact of the disease on their health and well-being to prevent further illness [4]. Diabetes self-management actions involve engagement in recommended behavioural activities such as healthy eating, medication adherence, being active, monitoring, reducing risks, problem-solving and healthy coping [5], which are all necessary for the successful management of the disease [15]. Level of adherence to diabetes self-management differs in patients, which implies that decision-making processes for self-management are

influenced by various factors, which could either serve as enablers or barriers. [16]

Peyrot M et.al in their study identified diabetes related distress as a major factor responsible for poor adherence to self-management in patients [7]. Study conducted by Jones L, et.al reported that difficulty in making lifestyle changes [17] and inadequate health care system communication interface [18] were related to poor diabetes self-management. In addition, financial constraints resulted in patients' inability to access diabetes clinical supplies and eat in line with appropriate dietary recommendations [19,21]. Nagelkerk *et al.*, [24] and Ghimire [22] reported that patients' lack of knowledge of a specific diet plan and perceived belief in social unacceptability of healthy behaviours [14] hindered healthy eating and participation in physical exercise. Furthermore, depressive symptoms and personal belief about medication were observed to be associated with lower adherence to diabetes medications [23].

Qualitative research is useful for understanding and describing human experiences, perceptions and feelings, promoting innovation, and giving a voice to marginalized groups as this method can provide researchers with a deep insight into the perceptions and experiences of individuals [25]. The present study aimed to identify the barriers to self-care practices in patients with diabetes. Accordingly, a qualitative thematic analysis technique was employed in the present study.

Materials and Sampling Methods

The present study is descriptive qualitative research aimed at understanding the barriers diabetes patients face in managing self-care. The study was conducted at selected urban primary health centres of Karnataka, South India. It took place from September 2024 to October 2024. The research population included Type 2 DM patients who were attending primary health centre to receive health care. The information of people with Type2 DM on age, sex, duration of diagnosis and address were obtained from OPD registers of the PHC. Participants who verbally agreed over phone were included in FGDs. In addition, written informed consent was obtained prior to FGDs. The inclusion criteria included: people who were diagnosed with T2DM by the physician for at least 1 year and usually sought healthcare from the hospital, people who were above 30 years old and able to express themselves in Kannada, Hindi or English language and were willing to participate. The exclusion criteria included: people with T2D who sought care for the first time and those who had comorbid chronic conditions. All people who fell within the inclusion criteria were selected using a purposive sampling technique and sampling continued until data saturation. The study used a thematic analysis method and data was collected from 25 T2DM patients through FGDs using semi-structured interview guide in a private room in selected urban PHC. The participants were divided into 4 groups ranging from 6 to 7 in a group consisting of 13 women and 12 men. None of the people approached by the researcher declined participation in the study. The primary researcher was the moderator and secondary researcher was an observer and was responsible for taking note. The moderator was responsible for managing the group interactions so that everyone would get

opportunity to express their view. The collected data were analysed with *NVivo* software.

The social-ecological model by McLeroy *et al.* was used to guide the study [30]. The model emphasizes that an individual's development is influenced by multiple interconnected levels of social and environmental factors. The model was used to guide the interview questions focussing on the intrapersonal, interpersonal, organizational and community-level factors. The model assumes that the promotion of health in the individual operates at levels that are based on the individual's beliefs and understanding, family and social support as well as institutional factors. The data were collected through FGDs with the participants using open-ended questions. After obtaining the necessary permits and making arrangements to attend health centres, the researcher provided some explanations about the study to the participants who met the inclusion criteria and if they wished, they were asked to participate in the FGD in a room in the primary health centre away from the noise. No one was present in the discussion room except the participants and the researcher. The participants voices were recorded with their consent. The duration of the FGDs ranged from 1 to 1.5 hour.

The initial questions asked in the FGDs were as follows

1. What is your understanding about Diabetes?
2. What do you mean by self-care?
3. Do you feel you have enough information to manage your diabetes effectively?
4. Do you understand the consequences of high or low blood sugar levels?
5. Are you able to perform recommended physical activities, or do physical problems make it difficult?
6. Are there times when you don't feel well, and does this make it hard to follow your self-care plan?
7. How often do you miss taking your medication, and what causes you to miss it?
8. Do you have a glucometer, and do you check your blood sugar regularly?
9. Do you ever feel isolated or stigmatized because of your diabetes?
10. Does anyone in your family support you with your diabetes self-management?
11. What physical and mental needs do you feel concerning these changes?
12. How do you cope with the stress of having diabetes?

To obtain more information and to clarify the content of discussion, probing questions were used such as: can you explain more? The collected data were analysed using thematic analysis [13]. After each FGD, the content of the discussion was typed word to word in Microsoft Word. Each interview was considered as a unit of analysis. To gain a general understanding of the transcripts, they were read carefully several times. Then, the transcripts were divided into meaning units and after condensing each meaningful unit, they were labelled as code. The codes were classified into sub themes based on their similarities and differences. Finally, the related sub- themes were extracted according to the latest concepts in the transcript and by classifying them, the themes were identified.

Table 1: An example of data analysis

Meaning Unit	Code	Sub theme	Theme
I don't know what food to eat to manage my blood sugar. I often forget to take medicine on time. I feel very tired, hungry and have no interest in work. I sometimes crave for sugary food when I'm extremely hungry. I have no time to do exercise.	Lack of knowledge	Personal attributes Beliefs Emotions	Individual factors
	Forgetfulness		
	Laziness		
	Craving for food		
	Time constraints		

To evaluate the trustworthiness of the data in this study, the four criteria proposed by Lincoln and Guba were used [26]. The credibility of the data was ensured by the researchers' involvement in the subject under study for a long time and allocating sufficient time for collecting the data. Since the researcher knew health care providers, with their help it was easy to gain trust of the participants, able to collect real, enriched data on the research problem by taking into account different perspectives. Also, researcher conducted member check for credibility. Besides, the conformability of the findings was ensured via peer check (having the data reviewed by the colleagues). The dependability or consistency of the data was confirmed via external check (having the data reviewed by experienced experts) and also via the code–recode strategy that was used in the data analysis process. Finally, to improve the transferability of the data, rich, accurate, and step-by-step descriptions were used.

Results

The participants in this qualitative study were 25, out of which 13 were women and 12 men with a mean age of 51.16 ± 1.15 years. The mean duration of diagnosis with Type 2 DM of the participants were 5.72 ± 2.5 years. Besides, 44% of the participants had more than Pre university education and 48% with less than Pre university education, and 8% of them were uneducated most of them (60%) were unemployed. Moreover, 80% of the participants lived with their spouse and children, and 56% of them reported a moderate-income level. Study revealed that lack of knowledge on disease condition, duration of diagnosis and adherence to treatment, poor socio-economic status, lack of family support and work-related pressure hindered patient's self-care management.

Table 2: The participant's demographic characteristics

Variable	Mean ±SD	Frequency/Number
Age (years)	51.16 ± 1.15	25
30-40		3
41-50		10
51-60		9
60 & above		3
Duration of diagnosis	5.72 ± 2.5	25
Sex		
Male		12
Female		13
Education		
Uneducated		2
Less than Pre university education		12
More than Pre university education		11
Occupation		
Employed		15
Unemployed		10
Socio economic status		
Poor		9
Moderate		14
High		2
Marital status		
Married		20
Separated/Widowed		5

Table 3: Themes, sub-themes, and codes

Themes	Sub themes	Codes
Individual factors	Inadequate knowledge and skills Motivation & behavioural factors	Lack of knowledge Forgetfulness Laziness Craving for food Time constraints Beliefs about illness Feeling unwell
Socio cultural and economic factors	Social network and support environment Cultural values & practices Financial issues	Family pressure Financial barriers mLimited resources Cultural diet issues Informational misconceptions
Healthcare system factors	Access to services Quality of care	Poor provider communication Long wait times Lack of resources-health system Inadequate counselling
Emotional & Psychological factors	Psychological & emotional distress	Coping Stress Stigma Isolation
Environmental factors	Inaccessible community resources	Lack of exercise Transportation Unsafe environment Bad weather

Theme 1: Individual factors

The results of the study indicated that how internal or personal factors hinders a patient's ability to manage their diabetes.

Inadequate knowledge and skills: Patients does not know basic information on diabetes management practices like healthy dietary options, importance and duration of physical exercise, awareness about the effects of harmful practices such as alcohol and tobacco consumption.

I don't know how much quantity of food to be taken, I feel extremely hungry often, so I eat instant food, sugary drinks. I know that I should not take sugary food so I avoid eating fruits. (Participant 9, 45 years).

I am aged enough and I can't do any physical exercise or yoga, I feel I'm taking my medicines that is enough to manage my condition. I'm tired of going for walk all these years. (Participant 12, 62 years).

Motivation & behavioural factors: Patients hold false beliefs about diabetes management including alternate remedies. Some say they often feel demotivated, lazy, forgets to perform self- management tasks.

I should do all household chores, cook for family, send children to school. When I take my breakfast, it will be almost 12 in the noon. I drink coffee, eat biscuit and manage hunger. My morning dose of medicine will be skipped sometimes. (Participant 1, 43 years).

It's tough sometimes; I forget to take my medicine. I forget and then remember. When I remember, it's already time for the next dose. So, I take the current one and skip the previous one. My wife often reminds me, but I still forget sometimes (Participant 14, 57 years)

Doctor suggested for monthly sugar tests, exercise but due to my busy work schedule I don't have time to visit hospital for regular tests. I don't eat in time hence I don't take medicine when I skip meals. (Participant 15, 40 years).

Theme 2: Sociocultural & economic factors

These focus on how patient's social network, social event, cultural values and practices, traditional food habits and financial situation affect their diabetes management.

Social network and support environment: Participants pointed to lack of family support in maintaining healthy diet and exercise regimen. Some stated they receive misleading advice from neighbours/friends.

My relative suggested me to take neem leaves, bitter guard juice & certain herbs instead of diabetic medicine. I tried it and I feel it is working so I don't take medicine (Participant 4, 41 years).

Cultural values & practices: Patient finds it difficult to maintain their diet during festivals and social gatherings. They also told it's difficult to adhere to dietary guidelines due to cultural food preferences.

I avoid attending functions because my relatives notice me if I don't eat sweet and other items which elevates my sugar level. I don't want people to know about my diabetes. I can't avoid eating binge during festivals and gatherings (Participant 10 & 11, 51 & 53 years).

Financial issues: Patients lack financial resources for medication, tests, apart from the Govt. supply. Few stated they have constraints to get nutritious food even.

I can't take the medicines regularly due to high cost, insulin costs too much and I can't afford for it as I'm a daily wage worker. Doctor prescribed few tablets from outside but I only take freely available medicine which I get from PHC. This disease is not for poor people like me, I'm sad for my fate, I should die soon... (Participant 22, 54 years).

A personal glucometer allows people with diabetes to monitor their blood sugar levels independently, anytime and anywhere. This gives them more control over their condition and regular monitoring helps detect sudden changes in blood sugar levels early, allowing corrective action before serious complications arise.

'... I don't have a glucometer at home. It's quite troublesome. Sometimes my blood sugar fluctuates suddenly.' (Participant 2, 55 years)

Theme 3: Healthcare system factors

These are the issues related to the accessibility and quality of healthcare services.

Access to services: Patients complains of not getting prescribed medicines, they need to wait long time to receive treatment and also says there is no specialist service available at primary health centre.

I don't want to visit hospitals because of the long waiting time. I should take leave or lose my daily wage in order to get my test done and consult the doctor. (Participant 25, 49 years old).

If I visit PHC we get only sugar test done but no other tests for my co-morbid conditions. I should visit private/specialized clinic to get it done. This costs me too much and hence I skip the tests (Participant 24, 50 years old).

Quality of care: Participants stated they don't get adequate information and has unhelpful communication from healthcare providers

I get the same medicines when I go for follow-up, my sugar level is not decreasing, if I ask to change the medicine and give me higher dose doctor refuses. My peer group suggest me to change the doctor but I'm stuck with confusion due to my financial constraint (Participant 7, 56 years old).

I don't get sleep in the night, I have burning sensation in my feet and I don't have anyone to talk about my condition. I feel like sharing my problem but I'm unsure who to talk to. I wanted to share with doctor in the hospital but due to overcrowd and rush for consultation I deny and only get my refill medicine and come back home (Participant 8, 54 years old).

Theme 4: Emotional & Psychological factors

Psychological & emotional distress: Patients feel ashamed of their condition and avoids social situations. They feel burdened by the lifelong daily demands of managing diabetes. They blame themselves for their diagnosis and fears for injections leading to non-adherence.

I have been diagnosed with diabetes for 12 years. Initially I was able to manage my condition. But as years passed my physical strength is not letting me to do activities, I feel boredom and I get angry why me? Why I don't get support from family...sometimes it is ok but otherwise I'm alone, no one can understand my situation... (Participant 17, 49 years old).

With diabetes in hand no enjoyment in life. It's easy to give advice and I feel yes, I should follow the routine management as told by doctor. but working in shifts, sleepless nights, no food in time, can't take medicines properly, eating food from canteen, work stress etc makes me stressful. I don't get time to follow self- practice. It's a curse for life (Participant 19, 51 years old).

Theme 5: Environmental factors

External factors such as lack of space for exercise, weather conditions like rain and cold influence patient's self - management of diabetes.

I skip walking during rainy season, when its cold outside, rest of the days I regularly go for walk. When I am away from home, I can't manage to go for walk as I do at home. (Participant 23, 38 years old).

People say you should walk, do exercise etc to control sugar level. But we don't have a park, space for walking in the place I live. It's a matter of shy too when all men walk around, and we go for walk. (Participant 18, 46 years old).

Discussion

The present qualitative study identified the different type of barriers affecting the self-care management in patients with Type2 DM in selected primary health centres of Karnataka, South India. The study was conducted using a thematic analysis method and data were collected through Focus Group Discussions (FGDs) with 25 Type 2 DM patients.

This study's findings highlight significant challenges participants face in managing their diabetes independently. Although few participants possessed basic knowledge of diabetes, they lacked a deeper understanding of the recommended dietary practices and the long-term complications that can arise from uncontrolled diabetes. Recent studies emphasize the ongoing challenges in the self-management of diabetes [11,12]. Patients often struggle to control their blood glucose levels due to a limited understanding of the disease dynamics and self-care practices [6,10]. Despite diabetes education being a key component of self-management programs, the effectiveness of individual interventions remains inconclusive [8,9].

The study found that some diabetes patients missed medication schedules due to forgetfulness. Several studies from the Middle East, North Africa, and Saudi Arabia consistently identify forgetfulness as a primary reason for non-adherence. [27] The research also showed that most participants did not own a personal glucometer. As a result, they could only measure their blood sugar levels when visiting the hospital for routine check-ups and could not monitor their glucose levels at home as recommended for diabetes management.

This study found that long waiting times at diabetes clinics were a significant barrier to patient satisfaction and treatment adherence. Perceived waiting times, rather than actual waiting times, have a stronger relationship with patient satisfaction. Studies have shown that patients who feel their waiting time is longer tend to be less satisfied with the medical services provided and are more likely to discontinue their treatment [28]. A study by Wozniak *et al* (2020) [29], says lack of adequate infrastructure and healthcare professionals in the community poses a barrier to implementing self-care management programs [29]. Participants reported challenges like limited training facilities, insufficient comprehensive health clinics, and

limited access to professional medical personnel. Additionally, the distance to the nearest healthcare facility has become a significant issue, especially in emergencies.

This study implies that provision of ongoing self-management education/support through the use of mobile phones may help address the various difficulties (including time/financial constraint, diabetes distress, and limited access to care providers) encountered by patients and foster adherence to recommended self-management activities, which are necessary to prevent the risk of developing diabetes complications. Furthermore, this study presents an in-depth understanding of the experiences of diabetic patients and provides useful insights to health professionals and researchers on how to improve the frequency and quality of self-management support provided to diabetic patients to achieve better health outcomes.

Conclusion

This study reveals the complex challenges faced by individuals with diabetes in managing their condition. This study identified common gaps in the skills and self-efficacy of people with T2DM as well as barriers to self-management in this population. The main obstacles to achieve optimal glucose control are a lack of knowledge about diet and disease management, barriers to access healthcare resources, and limited social support. The findings highlight the need for improvements in the comprehensive diabetes healthcare system. There is a need to develop diabetes education programs tailored to participants' needs, involving community, forming Patient support groups and utilizing various media. Additionally, improving access to primary healthcare facilities, providing affordable diabetes aid, and optimizing service wait times are necessary. Diabetes health care stakeholders may consider strategies for regular educational reinforcement in patients in order to foster healthy coping with diabetes stress, exercise planning to avoid hypoglycaemia, interpreting blood glucose patterns and adjusting medications or foods to reach the targeted blood glucose levels. Furthermore, designing of interventions that capitalize on how to improve patients' desire to reduce the progression of diabetes and the use of relevant technological devices could enhance diabetes self-care management. Consideration of these areas of educational reinforcement and interventions could enhance self-care management in patients and consequently improve their health outcomes.

Acknowledgements

The authors thank the health care team for permitting access to use the facility for the study. Special thanks to the respected officials of District health and Family Welfare team, we extend our thanks to the transcript team who helped us in this project. In addition, we sincerely appreciate the participants of this study.

Author's Contribution

A.P^{1,2} took part in designing the study, conducting the FGDs, transcribed the audio recordings to text. Firstly, the initial analysis was done, then identification and organization of meaning units into codes and preliminary groups of categories were made. ^{3,4,5} made a final structure for the codes as subthemes and themes followed by drafting the article. All of them contributed in the final manuscript.

References

- World Health Organization, Diabetes guidelines, 2024. <https://www.who.int>
- Adu MD, Malabu UH, Malau-Aduli AEO, Malau-Aduli BS. Enablers barriers to effective diabetes self-management: A multi-national investigation. *PLoS ONE*.2019;14:0217771.
- American Diabetes Association. Introduction: Standards of Medical Care in Diabetes,2018:1:41-2.
- Barlow JH, Sturt J, Hearnshaw H. Self-management interventions for people with chronic conditions in primary care: Examples from arthritis, asthma diabetes. *Health Education*,2002;61:365–378.
- Gazmararian JA, Ziemer DC, Barnes C. Perception of barriers to self-care management among diabetic patients. *Diabetes Education*,2009;35:778–88.
- Acil D, Bahar Z. Perceived barriers to diabetes management at home: a qualitative study. *Turkish J Biochem*,2019;44:621–629.
- Peyrot M, Rubin R, Lauritzen T, Snoek F, Matthews D, Skovlund S. Psychological problems barriers to improved diabetes management: results of the Cross-national Diabetes Attitudes, Wishes Needs (DAWN) Study. *Diab Med*,2005;22(10):1379–85.
- Povey RC, Clark-Carter D. Diabetes and healthy eating. *Diabetes Educ*,2007;33(6):931–59.
- Chen Y, Sloan FA, Yashkin AP. Adherence to diabetes guidelines for screening, physical activity and medication onset of complications death. *J Diabetes Complications*,2015;29(8):1228–33.
- Chlebowy DO, Hood S, LaJoie AS. Facilitators barriers to self-management of type 2 diabetes among urban African American adults. *Diabetes Educ*,2010;36(6):897–905.
- K Wdowik MJ, Kendall PA, Harris MA, Auld G. Expanded health belief model predicts diabetes self-management in college students. *J Nutr Educ*,2001;33:17–23.
- Tomky D, Tomky D, Cypress M, Dang D, Maryniuk M, Peyrot M, *et al.* Aade position statement. *Diabetes Education*,2008;34:445–449.
- Naeem, Wilson Ozuem. A step-by-step process of Thematic analysis to develop conceptual model in Qualitative research. *Sage Journal*,2023;24(2):105–12.
- Bandura A. Health promotion from the perspective of social cognitive theory. *Psychologic Health*,1998;13(4):623–49.
- Clark NM, Becker MH, Janz NK, Lorig K, Rakowski W, Anderson L. *et al.* Self-management of chronic disease by older adults: a review and questions for research. *J Aging Health*,1991;3(1):3–27.
- Mary D. Adu, Usman H. Malabu1, Aduli E. O. Malau-Aduli, Bunmi S. Malau: Enablers barriers to effective diabetes self-management: A multi-national investigation,2019;14(6):217-71.
- Byers D, Garth K, Manley D, Chlebowy D. Facilitators and barriers to Type 2 diabetes self-management among rural African American adults. *Journal of Health Disparities Research Practice. J Health Dispar Res Pract*,2016;9(1):9.
- Jones L, Crabb S, Turnbull D, Oxlad M. Barriers facilitators to effective type 2 diabetes management in a rural context: a qualitative study with diabetic patients health professionals. *J Health Psychol*,2014;19(3):441–53
- Schoenberg NE, Drungle SC: Barriers to non-insulin dependent diabetes mellitus (NIDDM) self-care practices among older women. *J Aging Health*,2001;13(4):443–66.
- Hunt LM, Pugh J, Valenzuela M. How patients adapt diabetes self-care recommendations in everyday life. *J Fam Pract*,1998;46(3):207–16.
- Campbell DJ, Manns BJ, Hemmelgarn BR, Sanmartin C, Edwards A, King-Shier K. Understanding financial barriers to care in patients with diabetes: an exploratory qualitative study. *Diabetes Educ*,2017;43(1):78–86.
- Ghimire S. Barriers to Diet Exercise among Nepalese Type 2 Diabetic Patients. *Int Sch Res Notices*, 2017.
- Chao J, Nau DP, Aikens JE, Taylor SD. The mediating role of health beliefs in the relationship between depressive symptoms medication adherence in persons with diabetes. *Res Soc Adm Pharm*,2005;1(4):508–25.
- Nagelkerk J, Reick K, Meengs L. Perceived barriers and effective strategies to diabetes self-management. *J Adv Nurs*,2006;54(2):151–8.
- Speziale HS, Streubert HJ, Carpenter DR. Qualitative research in nursing: advancing the humanistic imperative, Philadelphia: Lippincott Williams Wilkins, 2011.
- Denzin NK, Lincoln YS. *The SAGE handbook of qualitative research*, Thousand Oaks. SAGE Publications, 2011.
- Joam M, Mohd Ibrahim, Haidi MA. Assessing prevalence of barriers to medication adherence in patients with uncontrolled diabetes attending primary health centre in Qatar. *Prim care Diabetes*,2018; 12(2):116-25
- Sato S, Tosaki T, Oshiro C, Kudara A. The influence of outpatient waits times healthcare professional's common behaviour on treatment satisfaction and the intention to drop out,2018;1:67.
- Wozniak LA, Johnson JA, Eurich DT. Working towards a better understanding of type 2 diabetes care organization with first nations communities: A qualitative assessment. *Archives of Public Health*,2020;78(7):1–8.
- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ*,1988;15(4):351-77.