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Patient's Perspective on Barriers and Facilitators in Management of Type 2 Diabetes: A Systematic Review

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Abstract

Objective: The purpose of this review is to summarize existing knowledge regarding various barriers and facilitators in the management of Type 2 diabetes from the perspective of patients. **Method:** A comprehensive electronic search was conducted which included three sources PubMed, Embase, and Web of Science, and studies from 1997 to 2021 were included. Around 1687 papers were screened and 46 studies were included in the final analysis. **Result:** Three major areas of barriers and facilitators in Type 2 diabetes management were identified: Individual factors**:** factors which are emerging due to a patient's personal ability to take care of type 2 diabetes (adherence to diet, physical activity, self-monitoring of blood glucose, medication adherence, psychological factors: this includes emotional factors, beliefs and attitude of patients. Organizational factors**:** it includes diabetes education factors, economic constraints and health care provider's issues and social factors: this includes factors associated with family, friends, and others social issues. **Conclusion:** Identifying barriers to diabetes management is vital to improve the quality of care of diabetes patients, including the improvement of glycemic control, and diabetes self-management. Further research which considers these barriers and facilitators are necessary for developing interventions for individuals with type 2 diabetes.

Keywords: Barriers, Facilitators, Type 2 diabetes, Patient's perspective

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Introduction

Diabetes is a chronic disease that requires a person to make a multitude of daily self-management decisions and to perform complex care activities.[1] Glycemic control is fundamental to the management of diabetes. Prospective randomized clinical trials such as the Diabetes Control and Complications Trial[2] and the U.K. Prospective Diabetes Study[3,4] have shown that improved glycemic control is associated with sustained decreased rates of retinopathy, nephropathy, and neuropathy.[5]

Type 2 diabetes self-management interventions are diverse. These interventions aim to empower patient,[6] increase involvement of patient, and reduce burden on health system.[7] Thus, diabetes management make it necessary to make considerable behavioral and lifestyle changes.[8] However, overall, type 2 diabetes is relatively managed poorly.[9] Both health-care professionals (HCP) and patients report low levels of patient adherence to recommendations.[10] The factors which potentially inhibit effective management includes the cost of diabetes medications, time constraint and lack of diabetes education,[11] along with social isolation and a lack of knowledge about diabetes.[12] However, previous literature also suggest a lack of understanding between patients and practitioners about what is required for effective management.[13] In addition, it has also been found that health professionals and patients have difference of opinion while reporting barriers when discussing for management difficulties.[14] The following review is done to identify barriers faced by type 2 diabetes patients and facilitators suggested by them to increase their adherence of self-management regimens. Self-management of diabetes includes, as derived from the studies under consideration, adherence to dietary regime, adequate Physical activity (PA), self-monitoring of blood glucose (SMBG), adherence to medication, foot care and stress management.

Method

A comprehensive electronic literature search was conducted and articles published from 1997 till 2021 were included using MEDLINE (US National Library of Medicine, National Institutes of Health, Bethesda, Maryland), Google Scholar (Google, Mountain View, California), and PubMed (US National Library of Medicine, National Institutes of Health, Bethesda, Maryland).

The following search terms were included in various combinations: barriers, facilitators, type 2 diabetes patients diabetes management, adherence, self-management of diabetes, dietary, PA, medication, SMBG, attitude, belief, behavior, perception, difficulty, and ease in type 2 diabetes management.

Inclusion and Exclusion Criteria

The inclusion criteria required the studies to be qualitative or quantitative, in any population, that primarily assessed the barriers and facilitators faced by type 2 diabetes patient and it must be from the perspective of patients. Studies were required to identify the difficulties faced by the patients of type 2 diabetes patients and factors which could help them in managing their disease better. In addition, studies had to be published in a peer-reviewed journal. Protocols, review articles, and commentaries were excluded. In addition, conference papers and editorials were also removed.

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Around 1687 papers were screened and 46 were included in the study for the final analysis [Figure1].

Result and Discussion

Analysis of the research studies synthesized range of barriers and facilitators in type 2 diabetes management. The barriers and facilitators which emerged out are divided into following groups:

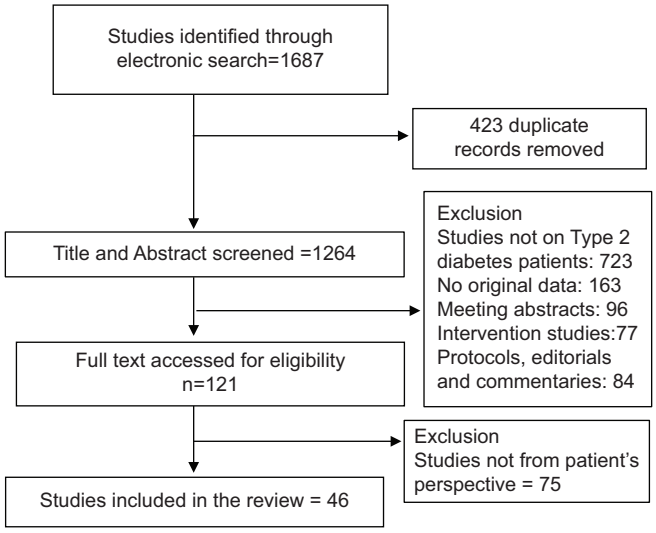

Figure 1: Flow diagram of included studies in the review

1. Individual factors: These are the factors which are emerging due to a patient's personal ability to take care of type 2 diabetes. These are:
   a) Adherence to diet
   b) PA
   c) SMBG
   d) Medication adherence
   e) Psychological factors: This includes emotional factors, beliefs, and attitude of patients.
2. Organizational factors: It includes diabetes education factors, economic constraints, and health-care provider's issues.
3. Social factors: This includes factors associated with family, friends, and others social issues.

Studies included were from the range of ethnic groups and studies conducted in different countries covering multiple barriers and providing robust solutions to those problems. Information related to type of study, sample size, population characteristics, sample size, and type of barrier or facilitator identified is given in Table 1.

Individual Barriers Include 4 Factors

Dietary barriers

In a large-scale survey conducted by Glasgow *et al.* 1997, dietary barrier was found to be the most frequently reported barrier in diabetes self-management.[15] Patients face a range of problems while adhering to their dietary regime. The patient reported that they eat foods which potentially increase their blood glucose, such

Table 1: Summary of studies

Author, Year	*Country*	*Method*	*Sample size*	*Study group*	*Synthesis*
Glasgow *et al*. (1997)[15]	USA	Survey	2056	Heterogeneous group	Individual barriers
Hodge *et al*. (2000)[16]	USA	Focus Group Discussion	70	African American women	Social barriers and facilitators
Karter *et al*. (2000)[17]	USA	Survey	44,181	Heterogeneous group	Individual barriers
Shultz *et al*. (2001)[18]	USA	Survey	97	Heterogeneous group	Individual barriers
Aljasem *et al*. (2001)[19]	USA	Survey	309	Heterogeneous group	Individual barriers
Nthangeni *et al*. (2002)[20]	South Africa	In depth interview	25	Black south African	Individual barriers
Thomas *et al*. (2004)[21]	UK	Survey	406	Heterogeneous group	Individual barriers
Wen *et al*. (2004)[22]	USA	Survey	138	Hispanic	Individual and social barriers
Peyrot *et al*. (2005)[10]	USA	Telephone interviews	5104	Heterogeneous group	Individual and social barrier
Dutton *et al*. (2005)[23]	USA	Survey	105	Low-income African Americans	Individual barrier
Nagelkerk *et al*. (2006)[24]	USA	Focus group discussion	24	Rural adults	Individual, Organizational and Social Barrier and Facilitators
Lawton *et al*. (2006)[25]	UK	In-depth interviews	32	South Asians	Individual barrier
Mier *et al*. (2007)[26]	USA	Focus group discussion	39	Mexican Americans	Individual barrier
Kapur *et al*. (2008)[27]	India	Survey	350	South Asian	Individual barrier
Mulvaney *et al*. (2008)[28]	USA	Focus Group Discussion	24	American adolescents	Individual, social barriers and facilitators
Song *et al*. (2009)[29]	S. Korea	Focus group discussion	24	Korean older adults	Individual, Organizational, Social barriers and facilitators
Ali *et al*. (2009)[30]	Malaysia	Interview	18	Malay adults	Individual, Organizational barriers
Casey *et al*. (2009)[31]	Canada	Focus Group Discussion	16	Canadian adults	Individual barriers and facilitators

(Contd...)

Table 1: *(Continued)*

Chlebowy *et al*. (2010)[32]	USA	Focus Group Discussion	38	Urban African – American adults	Individual, Organizational, social barriers and facilitators
Marcy (2011)[33]	USA	Survey	98	American urban low-income group	Individual barriers
Shakibzadeh *et al*. (2011)[34]	Iran	Focus Group Discussion	43	Iranian adults	Individual, Organizational, social barriers and facilitators
Fukunaga *et al*. (2011)[35]	USA	Focus Group Discussion	74	Hawaiian adults	Individual, Organizational, social barriers
Onwudiwe *et al*. (2011)[36]	USA	Focus Group Discussion	31	African American	Individual, Organizational barriers
Singh *et al*. (2012)[37]	UK	Semi structured interviews	20	South Asians and whites	Individual, Organizational, social barriers
Hortensius *et al*. (2012)[38]	Netherland	In-depth interviews	15	White European	Individual barriers and facilitators
Mayberry *et al*. (2012)[39]	USA	Focus Group Discussion	45	American adults	Social barriers and facilitators
Mathew *et al*. (2012)[40]	Canada	Focus Group Discussion and interviews	35	Canadian adults	Individual, Organizational, social barriers and facilitators
Egan *et al*. (2013)[41]	Ireland	Survey	145	European	Individual barriers
Janes *et al*. (2013)[42]	New Zealand	Semi structured interviews	15	NZ Maori and NZ European	Individual, Organizational, social barriers
Safaii *et al*. (2013)[43]	USA	Focus Group Discussion	22	American young adults	Individual, Social and organizational barriers and facilitators
Booth *et al*. (2013)[44]	UK	In-depth interviews	16	European adults	Individual barriers and facilitators
Fort *et al*. (2013)[45]	Costa Rica and Mexico	Focus Group Discussion	70	Heterogeneous group	Psychological, Organizational and Social barriers and facilitators
Bhojani *et al*. (2013)[46]	India	In depth interview	16	Indian Urban poor adult	Social and organizational barriers
Ebrahim *et al*. (2014)[47]	South Africa	Semi structured interview	8	Heterogeneous group	Individual and organizational barriers and facilitators
Moonaghi *et al*. (2014)[48]	Iran	In-depth semi-structured interview	15	Iranian adults	Social and Organizational barriers and facilitators
Ong *et al*. (2014)[49]	Malaysia	In depth interview	15	Malayan adult	Individual barriers and facilitators
Jones *et al*. (2014)[50]	Australia	Focus group and telephone interviews	10	Rural Australian adults	Individual, Organizational, social barriers and facilitators
Byers *et al*. (2016)[51]	USA	Focus Group discussion and survey	21	Rural African American adults	Individual, Social barriers and facilitators
Berenguera *et al*. (2016)[52]	Spain	Interviews	43	Spanish adults	Individual, Organizational, social barriers and facilitators
Habte *et al*. (2017)[53]	Ethiopia	Interviews	39	Ethiopian Adults	Individual and Social barriers and facilitators
Advika *et al*. (2017)[54]	India	Interviews	13	Indian Adults	Individual, Organizational, social barriers and facilitators
Gehlawat *et al*. (2018)[55]	India	Focus Group Discussion	58	Indian Adults	Individual & Social Barriers & Facilitators
Kadariya and Aro (2018)[56]	Nepal	Survey	270	Nepal Adults	Individual and social barriers and facilitators
Baghikar *et al*. (2019)[57]	USA	Interviews	27	Mexican Americans	Individual, Organizational, and social barriers and facilitators
Hushie 2019[58,59]	Ghana	Interviews	33	Ghana adults	Individual and Organizational, social barriers and facilitators
Christensen *et al*. 2020[60]	Denmark	Interactive workshops	12	Danish and Muslim adults	Individual, Social and organizational barriers and facilitators

as sweets regularly because they like those foods.[18,19,32,37,40,42,44,51,52] Main dietary barriers faced by patients are listed in Table 2.

PA barriers

Barriers includes several emotional factors such as shame, laziness, and fear of injury.[23] At the root of these feelings was poor health or obesity. Obese patients often found exercise painful.[18,26] Difficult life situations also presented barriers to exercise,[23,61] and lack of time was a common excuse. List of factors is given in Table 3.

Barriers in SMBG

Obtaining blood glucose reading higher than normal gives the feelings of frustration and discouragement, leading to decrease in motivation thus non-adherence to SMBG.[38,49,62] Patients also have

Table 2: Dietary barriers faced by patients most frequently

Barriers	*Associated study*
Lack of understanding of provided diet plan and dietary principles	[20,24,34,40,43,44,50,58]
Lack of self-control, especially in social setting or otherwise.	[18,19,32,37,40,42,44,58]
Confusion about the quantity of food to be taken	[19,34,40,43,44,50,58]
Disliking for suggested foods	[18,20,44,51,52]
High cost of healthy food	[22,34,45,50,55]
Difficulty in preparing food (lack of time or skill)	[19,32,50,55]
Finding new regimen difficult or boring	[44,55,58]
Eating problem when away from home	[18,50]
Forget about eating food	[18,32]
Cultural pressures	[37,55]
Binge eating	[19]

Table 3: Physical activity barriers in type 2 diabetes patients

Physical activity barrier	*Associated study*
Comorbidities and pain, etc.	[25,29,31,35,44,45]
Lack of time due to responsibilities	[25,26,35,50,54]
Bad weather condition	[18,25,26,31,44]
Lack of motivation	[4,31,54,56]
Poor infrastructure and lack of facilities like park, streets etc.	[25,29,44,54]
Lack of information about different types of exercises	[34,50,54]
Shame or embarrassment in doing exercise	[25,56]
Lack of knowledge about controlling blood sugar while doing exercise and associated fear	[43,54]
Physical limitations	[35,36]
Forgetfulness	[29]

lack of awareness of target blood glucose they don't know what to do with their blood glucose values[36,43] also they are unaware about the importance of SMBG.[43] Likewise, there are several negative thoughts associated with SMBG which includes not wanting to know the blood glucose values when the blood glucose levels were likely to be high or denial of the disease.[38,49] Patients often reported that social stigma is a significant concern for them,[49,63] this causes anxiety which leads to suboptimal SMBG. Anxieties over the use of needles and pain also lead to decreased adherence to SMBG.[32,36,38,49] Most patients find cost as an important barrier to SMBG.[49,59,64,65] Some participants feel that their workplace is unsuitable for SMBG and find it difficult to practice SMBG outside their homes.[49,66] Some other patients do not follow SMBG due to laziness[38] or forgetfulness.[32] It was observed that patients who are less informed about their disease and plan of care are poor in practicing SMBG.[64,67]

Barriers in medication adherence

Difficulty in remembering to take regular medication i.e. forgetfulness is the most common barrier in medication adherence[24,29,30] apart from this lack of understanding of the importance of medication,[42] medication side effects,[35,53,57] and high cost of medicines[46,57] are also barriers to medication adherence.

Psychological factors

Emotional/psychological barriers

Frustration due to lack of result despite adherence leads to non-adherence due to loss of enthusiasm[24,36,44] also negative emotional effects such as fear, depression, anger or denial causes non adherence.[34,35,48,50] Lack of motivation also hinders the ability to self-care.[34,50] Emotional and psychological supports is a service need.[35]

Barriers due to beliefs and attitude of patients

What the patient do for managing their diabetes depends a lot on the kind of attitude they have and their health beliefs. Fatalism is common among patients diagnosed with diabetes patients believe that they have little or no control over their present or future health[23,31] and this is also associated with poor medication adherence and self-care.[68] Patients believe that diabetes is curable and their lack of acceptance of their disease led them to leave their normal course of action which is required for the management of diabetes[20,31,37] some patients also go for alternative medicines which again make them non-adherent to suggested medical regime.[20,31] Duration of illness also has its ill effects after long duration of illness people lose their enthusiasm to take care of themselves.[29,60]

Organizational Barriers

Diabetes education related barriers

Poor understanding of disease and its complication is a barrier towards self-care[29,30,34,43,60] this low level of diabetes creates further barriers like guilt, shame and fear,[42] improperly managed lifestyle,[34] poor diet related knowledge along with lack of information about PA requirements.[43] The patient feels difficulty with drug adjustments[45] or any single component of disease management.[50] Even if some patient gets diabetes education, it is difficult for them to recall after some time.[44] Service needs associated with this encompassed educational support for family members and the public.[35]

Economic barrier or resource constraint

Financial constraint is a big barrier[24,34,35,43,45,46,48] because its crisis directly affect the medicine and blood test supplies[34,35,45,48] consumption of healthy food[34,43,45] and access to health-care provider and health-care services.[34,43] Lack of insurance or range of its coverage also affect disease management[24,35,48] giving added stress.[24,34,48]

In an American study, it was reported that patients with lower household income were more likely to skip insulin due to the lack of affordability of insulin injections.[10]

Barriers due to health care provider

Patient perceive that they do not understand the information and care plan provided by the health-care provider because these plans are not individualized and too general in nature.[24,42] HCPs poor or negative attitude toward patients like they become too rude and lacking consideration of patients circumstances,[34,69] also hinders self-care sometimes they also interrupt patients or scold them this de-motivates patients.[43] HCP imposes unrealistic treatment goals to patients which result in not following any recommendations.[42] In some studies, it was reported that there was a lack of empathy and understanding of patients' problems, which was attributed to the short time allowed for the consultation. Patients mentioned that there was little individualization of treatments and that the same pattern of treatment was often applied to all patients.[34,52,69]

Many HCP use confusing medical and technical jargon which are difficult to understand by patients.[43,69]

Social Barriers

Social support barriers

Support of society, family, and friends play a very important part in diabetes self-care. If the patient is not able to get support, it becomes difficult for the patient to manage their disease. This lack of support mainly affects eating habit.[35,44] There is also social stigma associated with diabetes that resulted from having to use needles, use sick leave, and impose dietary limitations on themselves[35,50] which embarrass patients[50] this causes patients to conceal their disease.[35]

Women face greater difficulty in self-care due to their multi care giver role this led to greater stress and low attention on their own health.[44-46] There are social prejudices toward people with diabetes it is essential to prevent potentially disabling complications with the help of education and public awareness.[70] It is a documented fact that people with diabetes are more likely to experience prejudice at their work place and this affect patient's job retention.[71] This further affects access to health insurance and health maintenance.[72]

Facilitators and suggested strategies to overcome barriers in management of type 2 diabetes

a. Individual facilitators
b. Dietary factors.

The key to effective self-management lies in the hands of patient. Patient's motivation and willingness to assume charge for their own care are the biggest facilitator.[73] Dietary barriers could be overcome by the patient by attaining proper information and self-discipline. For gaining information, health-care provider plays the major role. Repeated exposures to this new information in more manageable amounts may be required to build knowledge and confidence in this area.[35] Provision of information in stages, alongside access to resources that can be used by patients in their own time and at their own pace outside of the formal education sessions, may be helpful.[44] Designing educational materials focusing on diet and medications, which is easy to access was desirable. Patients also suggested that these materials should include "visual graphics that would explain diet principles" along with "recipes and menu planning information."[43] The patients also suggested that they wanted the caregivers to provide information on educating significant family members, especially on modifying traditional methods of food preparation.[34]

PA

For PA, there need constant encouragement and monitoring.[31] Main motivator is the sense of physical as well as mental well-being.[25,26,31] For some patients' freedom from some medicines act as incentive to do regular PA.[31] Patients if get proper information and awareness regarding benefits of PA are likely to engage in PA.[26] One study also suggests that blood glucose monitoring may play a useful role by demonstrating the immediate effects of PA.[25] Patients also suggested that they need diversity in PA or coordinated exercise program which are not monotonous.[31,35] One study also showed association between having a pet and increased PA.[41] Group activity is also a facilitator as that gives constant encouragement.[26,31,32,41] Lawton *et al.* (2005) suggested raising the 'fun factor' to make exercise part of other socially rewarding activities in addition indoor sporting equipment help in curbing the problem of bad weather or embarrassment.[25] Health-care providers may encourage to use pedometer-based self-monitoring records and to encourage patients to maintaining their exercise behaviors.[31] One study also underline the importance of educating the whole family, and not just the person with diabetes, about the importance of PA in diabetes management.[25]

SMBG

Subsidies for test strips and needles would help to ease the financial burden for people with diabetes, and this would increase their adherence to SMBG.[74] One study suggested that interventions by health-care providers are required to help people with diabetes cope with negative feelings and to prevent these from influencing their decision to practice SMBG and other self-care practices.[49] It is suggested that health care providers improve awareness in people with diabetes through appropriate education regarding the other benefits of SMBG in diabetes control.[17,49] The fear of practicing SMBG in front of other people could be minimized through education and support, through counseling and peer support groups, which may help to reduce the emotional impact of stigma and enhance coping.[63]

Organizational Factors: Health Care Provider-Related Facilitators

Health care providers should facilitate support networks through empowerment interventions[75] to optimize self-care practices.[76] Access to care and HCP support was identified as an important element related to diabetes self-management.[59,75] Group diabetes education should be considered as this has been shown to increase adherence to recommended care.[75] It was shown that an empowerment-based diabetes self-management support intervention, consisting of weekly educational newsletters coupled with clinical feedback from the health-care providers, significantly improved the practice of SMBG.[76]

Psychological Facilitators

One study suggested that diabetes supports should address the whole person physically, psychologically, and socially.[35] Psychological well-being should be discussed with patients to identify those individuals who may need a referral to psychiatrist for evaluation and treatment and diabetes education programs should include the management of mental health. Diabetes care professionals should learn how to recognize the more common mental illnesses (i.e. major depression, bipolar disorder, and anxiety disorders) and refer the patients whenever appropriate.[34]

One study also emphasize a need for greater public awareness and education, coordinated services that address emotional and other health-related barriers, and flexible supports that help people incorporate diabetes management into their lives. In addition, the health care community should consider ways to support people with diabetes in maintaining positive lifestyle changes, which may be more cost-effective than simply implementing drug therapies.[76] Future interventions for people with diabetes should include coordinated programs that involve social, emotional, and lifestyle supports to help keep people healthy so they are able to take good care of themselves.

Social Facilitators

Many studies discussed how family support played an important role for managing their diabetes. Members of the family who gives support are spouses, children, and other family members with diabetes. Studies reported that these family members helped them in many ways such as preparing meals, gives reminder for medication, or to self-monitor patient's blood glucose or do blood glucose checks for them.[26,31,51,57] For some patients support of family and friends act as major motivating factor.[26,31] Family motivation as a facilitator to self-care is observed in most of the studies.[29,32,35,37]

A study emphasized a need to communicate with other people with diabetes about emotional barriers and ways to increase willpower and motivation, social and motivational supports such as frequent support groups helps in the management of type 2 diabetes.[35]

Several studies pointed out the role of faith and spirituality in the management of type 2 diabetes patients reported that faith in god give them emotional strength to perform their daily self-care activities.[16,45]

Discussion

In the present study, major barriers and facilitators in the management of Type 2 diabetes were identified. Dietary barriers are most widely reported barriers which includes an array of barriers from lack of knowledge about the dietary modification to non-availability of healthy foods. Portion control was difficult for many people with diabetes.[20,24,34,40,43,44,50] People often felt hungry when they tried to follow portion control.[20,24] In some studies patients mentioned that the type of food recommended to them was highly limiting their choices and it is difficult for them to adopt the given dietary regime in their routine.[18,20,44,52]

Designing educational materials focusing on diet and medications which is easy to access was desirable. Patients also suggested that these materials should include "visual graphics that would explain diet principles" along with "recipes and menu planning information."[43] The patients also suggested that they wanted the caregivers to provide information on educating significant family members, especially on modifying traditional methods of food preparation.[34]

Non-adherence to regular PA was another barrier which was reported in many studies. From laziness, procrastination to lack of time multiple barriers were reported. Difficulties in finding time for exercising due to work or home duties was reported as a major barrier in many studies.[25,26,35,50,54] Factors independent of an individual's decision-making, like weather or cultural barriers.[25] Factors such as lack of social support[61] also affect motivation to exercise. Fear of injury is also a barrier for the patients.[77] Participants identified additional health issues as being a barrier to their diabetes management. Physical limitations that stemmed from other illnesses or injuries prevented regular exercise.[35] Many solutions were also provided in the study like company of some other people to motivation by family members major facilitator to adhere to PA practices.

Some people find it difficult to manage time which is required for self-care[28] also lack of symptoms make patient believe that their blood sugar is under control due to which they avoid self-care.[37] Sometimes patients do not take their disease as seriously as they need to take, also make it less important for them to take care of their health.[39,42] Patient many times find it difficult to change their established habit or lifestyles.[39,44] Negative perception about the disease and giving up thinking that it is uncontrollable also makes self-care difficult.

In a study conducted by Hushie (2019) it was reported that patients expressed fears about how their diabetes might adversely affect family members and they were afraid that they will become a burden on the family or they will not obtaining the needed support from family members.[58] Such anxieties and fears should be catered by family members.

Fragmented health care services also affect self-care or poor access to HCP along with lack of specialized health professionals like endocrinologist or dietician.[50,69]

Social barriers specially associated with family support play very important role. Mayberry *et al.* (2012) identifies two types of families which are non-supporting one with sabotaging behavior -who know about the disease but did not help patients in performing diabetes self-care and second type with miscarried helping behavior in which if a family member try to help the patient, it causes conflict between them as patient don't want to follow the instructions.[39] Family support is required for performing some actions like reminding for SMBG, medication or for having any food.[43,60]

Continuous and regular diabetes education is very important for empowering the patient to cater the barriers they face in management of Type 2 Diabetes and facilitating themselves in better management of their disease.

Conclusion

Diabetes is a complex disease and the barriers to its management are multi-factorial. Better understanding of the mechanism about how the barriers are related to each other and how they work can lead to better techniques in management of diabetes. Also identifying the facilitators help in making the healthcare system and environment better to increase adherence to lifestyle modification.

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