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# WHEN TO REFER PEOPLE WITH DIABETES TO A DIABETOLOGIST FROM A FAMILY MEDICINE SETTING

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## ABSTRACT

The term diabetologist is being widely used in many countries, today. Although there is an increasing diabetes population for both type 1 and type 2, yet number of endocrinologists are way behind the necessity. In the outpatient settings of Family Medicine Physicians (FMPs) / Primary Care Physicians (PCPs) / General Practitioners (GPs), more people with diabetes (PWD) are being seen than in either secondary or tertiary healthcare fascilities. Diabetologist as a term mostly used for those physicians who are more eager to see PWD, thus mostly provide diabetes clinic rather than other internal medicine or endocrinology disorders. Although many FMPs like to do so, then both prescription and post-graduate education barrier arise. According to recent diabetes guidelines, newer molecules such as Glucagone Like Peptide -1 receptor agonists (GLP- 1RAs) and Sodium Glucose co-Transporter-2 inhibitors (SGLT-2i) are in the front line which are not allowed to be prescribed in the FMP care settings. Contribution of FMPs into diabetes care field should not be underestimated, so updated diabetes education programs should be organized during certain intervals. When to refer PWD to a diabetologist from a FMP setting is so crucial that in case of a need of multi-disciplinary approach, the best care would be provided.

**KEYWORDS:** Diabetologist, Diabetes, Family Medicine Physicians (FMPs), Primary Care Physicians (PCPs), General Practitioners (GPs)

## 1. INTRODUCTION

Although the term ‘diabetologist’ is not named officially in every country, there became an increasing trend for it to be used by some internists and less commonly by family medicine physicians (FMPs) owing to their preference of selecting people with diabetes (PWD) predominantly in their daily practice. Moreover, in endocrine era diabetes comes first in rank than thyroid gland disorders in frequency. By the way, many expert physicians on endocrinology prefer to call themselves ‘endocrinologist’ rather then this term; ‘diabetologist’.

## 1.1 PRESCRIPTION BARRIER

Practically, this irony will increase the awareness of diabetes on both sides -PWD and healthcare professionals (HCPs)-. Meanwhile, according to the new diabetes guidelines (1) since from the last decade at least, many molecules came into stage (2), although critical ones such as incretinomimetics –especially Glucagone Like Peptide -1 receptor agonists (GLP-1RAs)- and Sodium GLucose co-Transporter-2 inhibitors (SGLT-2i) are not affordable by many countries or not reimbursed by the insurance companies, and even if covered officially, not allowed primary care physicians (PCPs)/FMPs/general practitioners (GPs) to be prescribed.

## 1.2 TIME CONSTRAIN

Taking into consideration of the other morbidities in busy clinics, some physicians may not spare satisfying amount of time especifically for PWD. A diabetologist supposed to focus on not only bringing the glucose numbers down, but also act as a chief of orchestra organizing multiple consultations in order to get rid of complications unless postpone them. Some diabetologists even work with a dietician/nutrionist for better serve the diabetes management obtaining time in range (TIR) values with lesser hypoglycaemia and glucose variability (3) since apart from the glycated hemoglobin (HbA1c), these may be the offending tools for the development of undesired consequences of late complications of this metabolic diseaster.

## 1.3 TYPE 1 DIABETES

Most FMP settings ignore jumping deeply into the monitorization of a type 1 diabetes person. Lack of experience with multi-dose insulin regimens, even use of pumps at least in some, complexity of dose regimens with sliding scale arrangements, being most of these PWD at younger age –even some at puberty when diagnosed- push the FMPs/PCPs/GPs stay away from the labile diabetes form at his/her care setting. Even some professional centers hold a position for adolescent type 1 diabetes psychologist for steady state glucose profile throughout the day (4).

## 1.4 TYPE 2 DIABETES

Regarding the type 2 diabetes, when diagnosis was made, almost HCPs are five years late to witness its occurence, and this may vary from zero to twenty years according to diabetes epidemiologist, Paul Zimmet (5). That means cardiovascular complications already started in many cases at the time of the diagnosis. Overcoming solely of both microvascular and macrovascular complications in FMP setting may become a nightmare, so that many prefer to refer to a secondary hospital

for multiple consultations or a tertiary academic institution in case of a need for a number of procedures that may require sophisticated interventions, such as diabetic foot care.

## 1.5 DETAILED LABORATORY INVESTIGATION

In a FMP setting, even differential diagnosis of a challenging young case, -i.e; wondering the case having whether or not the type 1 diabetes (6)-, may not be performed due to low capacity of laboratory on biochemistry and immunology.

## 1.6 OVERFLOW OF PATIENT CIRCULATION

Lastly, a GP or a FMP may be unwilling to focus on diabetes -besides a number of other ailments- with burden of necessary education and trainings by the official healthcare organizations, although they are kindly encouraged for post-graduate courses by many diabetes organizations. Hosting a dietician and or a diabetes nurse (sister) can be costly that may keep those GPs/FMPs away from being part of only diabetes care and acting the role of a diabetologist.

## 1.7 DIABETES IN TÜRKIYE-MORE THAN WORLD AVERAGE

According to epidemiologic studies in Türkiye, diabetes prevalance doubled in a decade only (7,8), and estimated diabetes population was 17.1% for women and 14.2% for men whereas for pre-diabetes these figures became almost doubled for both genders (32.6% vs 25.2% (F/M)) (9). Recent (2025) IDF-Atlas revealed that Türkiye has 16.5% diabetes prevalance today (10). In the country, it is impossible to care all PWD with existing endocrinologists only despite this sharply growing epidemic.

Turkish Diabetes Foundation in collaboration with Turkish Ministry of Health provided Southeastern Anatolia Diabetes Project (GAPDIAB) in rural parts of the country in order to raise the awareness of diabetes by the public and increase the standards of care by the HCPs with organizing many audit studies as well as conferences and even glucose monitoring surveys (10,11) Most of the HCPs following this audit program were PCPs/FMPs/GPs which was an update for diabetes awareness aiming to teach when to refer to secondary or tertiary centers.

## 1.8 GLUCOSE MONITORING

Today, many applications are discovered and put into use, in order to monitor daily glucose values of PWD from a distance such as mobile ones and web services (12), but again this may need multi-disciplinary approach that is readily performed in academic institutions. Self monitoring blood glucose (SMBG) is more affordable as a comparison to continuous glucose monitoring systems (CGMS), meanwhile still may require extra time which is lacking in many care settings. Initiation of CGMS should be offered to people with type 1 diabetes early in the disease, even at time of diagnosis (13). Regarding the CGMS, although there is an increasing trend for the use of it, it is still not affordable by many PWD, although labile diabetes of any type, considerable number of diabetes people who are at puberty, some gestational diabetes cases and those on insulin pump therapy would be in need of CGMS instrument. Meanwhile, a young child or a person with cognitive impairment or dexterity, psycho-social, and/or physical limitations are other challenging risk factors when considering this application (13). Artificial intelligence (AI) equipped tools, such as insulin pumps or artificial pancreas models (13-17) are other chaotic sophisticated tools that will be also by the PCPs/FMPs/GPs.

One of the best glucose follow-up program is through HbA1c, and even if the measurement is performed via high protein lipid chromatography (HPLC) (18), standardization of the glycated hemoglobin (19) may become complicated due to features of diabetes cases such as people having hemoglobin variants, pregnancy at second or third trimesters or at the postpartum period, people having glucose-6-phosphate dehydrogenase deficiency, HIV, people on hemodialysis either owing to diabetes or any other reason, people having recent blood loss or transfusion, people on erythropoietin therapy, etc. Standardization of the A1C test should be performed using a method that is certified by the National Glycohemoglobin Standardization Program (NGSP) as traceable to the Diabetes Control and Complications Trial (DCCT) reference assay. In Türkiye, we carried out an investigation on HbA1c (A1c) standardization program in order to reduce the variability among different laboratories (19).

## 1.9 DIABETES PSYCHOLOGY AND BEHAVIORAL SCIENCE

Diabetes management comprises not only writing prescription or re-fill the bottles, but organize also following up the medications taken, use of diabetes technologies, advise and encourage the physical activity as well as healthy eating to promote optimal diabetes health outcomes. Additionally, psychosocial care should be provided to all people with diabetes, with the goal of optimizing health-related quality of life outcomes. Diabetes care teams should implement psychosocial screening protocols for general and diabetes-related mood concerns as well as other topics such as stress, financial, social, family, emotional, and psychiatric history (20). This may also a need to a referral to behavioral HCPs or other trained health care professionals, ideally those with experience in diabetes, for further assessment and treatment of the symptoms of diabetes distress, depression, suicidality, anxiety (21), treatment- related fear of hypoglycemia (4,22), disordered eating, and/or cognitive capacities, intentional omission of insulin (4,22,23) or oral medications such as sulfonylureas (24) for the fear of gaining weight (4,22-24), repeated hospitalization for diabetic ketoacidosis, inability to perform self-management behaviors, before undergoing bariatric (metabolic) surgery (25). All of these and fear of complications either due to diabetes itself or prescriptions of insulin may give rise –not for all though- to become reluctant to engage the responsibility of PWD by many PCPs/FMPs/GPs (4). This does include not only people with type 1 diabetes who are on intensive insulin regimen,

but type2 diabetes as well since converting from pills into insulins may become challenging in some outpatient settings whether or not associated with diabetes complications (26).

## 1.10 SLEEP DISORDERS AND MULTI-DISCIPLINARY APPROACH

Even if limiting caffeine may be helpful in some cases with sleep disorders, remaining PWD alone or accompanied with morbid obesity and having sleep apnea syndrome can make the management of diabetes complicated, and this will also necessiate multi-disciplinary approach, however availability of that organization might be lacking in FMP settings.

## 1.11 OBESITY MANAGEMENT AND FOLLOW-UP

American Diabetes Association (ADA) dictates clinicians to use '*people with diabetes*' rather than '*diabetes people*' or '*diabetics*' and use '*people with obesity*' rather than '*obese people*' (27). Obesity is so much common with type 2 diabetes (28) so that some would like to call *'Diabesity'* rather than diabetes and obesity (29). Although body mass index (BMI, kg/m2) definitions describe 30 and above as a criteria to call obesity, this number is way higher for Asian population as the cut off criteria for obesity which is accepted to be 25 kg/m2 by the international authorities (30). Other than BMI, waist circumference, waist-to-hip ratio, and/or waist-to-height ratio are all suggested to be performed for part of thorough examination at least annually, suggested by the ADA (27). Accordingly in 2005, IDF defined metabolic syndrome criteria (31,32) depending on the waist circumference different than the Adult Treatment Panel-III (ATP-III) (33). All of these anthropometric measurements in a FMP outpatient setting may not be provided with burden of patients waiting outside the examination door and again with a number of other co-morbidities awaiting for their polypharmacy refills. While bariatric surgery became popular for diabesity, lower threshold for BMI for operation indication may allow many candidates to get rid of multiple insulin injection therapies and associated other glucose lowering medications with the hope of having diabetes free life. Careful patient selection will not be discussed here, meanwhile remindfully, I need to point out that considerable number of PWD (type 2) even if had A1c levels drop into normal limits after the surgery, some may face with increasing glycaemic level that does necessitate re-starting at least some of the medications afterwards. Also, those underwent operations with hyperglycaemia may experience hypoglycaemia later on (*Dumping Syndrome*) that would not be properly managed at every FMP outpatient settings. Some may offer nutritional, behavioral and exercise therapy all together in order to obtain a better body shape with at least 5% weight loss (20), however bringing all these three disciplines in most FMP outpatient settings are costly and sparing extra-time in so much busy clinics is also again very challenging.

## 2. DISCUSSION

In order to reduce the complications of diabetes, glycaemia, lipid and blood pressure managements and prescription of medications with cardiovascular and kidney benefits should be provided (34). However, for many countries today prescription barrier for FMP will arise although these drugs are at very first rows of the algorhytm by (ADA), today (2). All of the complex medications from different classes will also require monitorization for both their safety and efficacy (35), additionally co-morbidities such as diabetes related cardiovascular problems such as ischeamic heart disease, cardiac failure, high blood pressure –resistant to even sometimes three different pressure reducing agents-, kidney failure with challenging electrolyte imbalances or even end stage renal failure with peritoneal dialyses or hemodialysis program will increase the burden of healthcare in a routine daily practice. Again since the cardiovascular benefits of SGLT2 inhibitors or GLP-1 receptor agonists are not contingent upon A1C lowering according to updated guidelines (2,36), necessity of prescription of those medications arise for PWD, unless contraindicated. Meanwhile, prescription of them are not allowed to FMPs by the official health authorities in many countries. Relatively having lower-cost medications than aforementioned ones for glycemic management (i.e., sulfonylureas and human insulin) in some countries although carrying risks for hypoglycemia, weight gain and in case of kidney failure, contra-indicated *(i.e; metformin & sulfonylureas)*- are remaining for FMPs to battle with this metabolic disorder.

While A1c from the beginning may affect which drugs to begin with soon after diagnosis, this biochemical tool may rise during a follow- up program that will increase the complexity of the management of PWD, and may need referrals to upper care centers.

Of the PWD, 5–10 percent will be having type 1 diabetes and screening of pre-symptomatic ones for immunogenicity will be problematic for the lack of kits to measure i.e.; insulin, glutamic acid decarboxylase (GAD), islet antigen 2 (IA-2), or zinc transporter 8 (ZnT8) (6). Because multiple confirmed islet autoantibodies is a risk factor for clinical diabetes, referral to a specialized center for further evaluation and/or consideration of a clinical trial or approved therapy to potentially delay development of clinical diabetes should be considered. Standardized islet autoantibody tests are recommended for classification of diabetes in adults who have phenotypic risk factors that overlap with those for type 1 diabetes (e.g. younger age at diagnosis, unintentional weight loss, ketoacidosis, or short time to insulin treatment) (6). Treating most adults with type 1 diabetes with CGMS or multiple daily doses of prandial insulins (insulin analogs) (injected or inhaled) and basal insulin are preferred over injectable human insulins to minimize hypoglycemia risk (22,23,37).

People with type 1 diabetes having severe chronic kidney disease (GFR less than 30 ml/min) or having severe metabolic complications such as frequent hypoglycaemia, unawareness of hypoglycaemia, having frequent ketoacidosis, incapacitating with exogenous insulin therapy with intact/stable or impaired kidney function will be candidate for dual transplantation (either kidney plus pancreas or kidney plus beta cell), and this cannot be even handled in primary care center (35).

Many international clinicians pointed out that complicated diabetes presentations to be referred to secondary or tertiary centers. Also, people with type 1 diabetes, or PWD and yet A1c could not be brought within normal levels despite follow-up of more than six months, or those in need of GLP-1 receptor agonist from the initial presentation, PWD on insulin needing 1.5U/kg/day, MODY or LADA diabetes, PWD having neuromuscular problem are all enlisted as referral candidacy.

Management of diabetes during diseasters such as earthquakes are also challenging. Three years ago (Feb 6, 2023) Türkiye experienced two devastating earthquakes at a time during winter, affecting eleven of the eighty-one provinces with a population of 15 million in the South-east part of the country (38). Time was so invaluable for those in need of insulin preperations especially for PWD (*especially for type 1*). Luckily, previously two important projects provided even decades ago helped organize for both delivery of the anti-diabetic products and successful swift communications and necessary aid plans in order to get rid of acute complications. One of them was Southeastern Anatolia Diabetes Project (*GAPDIAB Project*) (10) and the other one was Presidency of Türkiye Type 1 Diabetes Peer Project that were both organized by Turkish Diabetes Foundation in collaboration with Turkish Ministry of Health. During earthquakes Crush-related acute kidney injury (AKI) has been reported in 2%–5% of all earthquake casualties (39). For those already having diabetes entrapped under the rabels and ruins with dehydration all of which make the PWD prone to kidney failure even to death.

Apart from all challenging associated ailments, for PWD immunization is important which is part of preventive medicine and successfully performed by general practitioners, today.

**Table 1**, **Figure 1 & 2** nicely summarize the referral criteria for specialist diabetology consultation in patients with diabetes managed in family medicine settings.

**Table 1:** Referral criteria for specialist diabetology consultation in patients with diabetes managed in family medicine settings

| Referral domain | Clinical referral criteria in family medicine | Suggested urgency | Rationale | References |
|---|---|---|---|---|
| Acute metabolic emergencies | Suspected diabetic ketoacidosis, hyperosmolar hyperglycemic state, severe dehydration, marked symptomatic hyperglycemia, or acute metabolic instability | Immediate | These conditions require urgent specialist and often hospital- based management, including rapid biochemical assessment and insulin–fluid therapy. | [40] |
| Newly diagnosed or diagnostically uncertain diabetes | Newly diagnosed type 1 diabetes, suspected latent autoimmune diabetes in adults, monogenic diabetes, pancreatogenic diabetes, ketosis-prone diabetes, or atypical phenotype | Urgent | Diagnostic clarification and individualized treatment planning may exceed routine primary care management. | [40] |
| Persistent failure to achieve glycemic targets | HbA1c remaining above individualized target despite appropriate lifestyle counseling, adherence review, and optimized pharmacotherapy | Routine to Semi-urgent | Ongoing hyperglycemia despite structured primary care may indicate the need for treatment intensification, diagnostic reassessment, or specialist-guided regimen adjustment. | [41] |
| Complex Insulin management | Need for basal–bolus insulin, difficult insulin titration, marked glycemic variability, or difficulty balancing | Semi-urgent | Specialist support may improve insulin adjustment, structured education, and individualized glucose-lowering strategies. | [40,41] |

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| | hyperglycemia and hypoglycemia | | | |
| Recurrent or Severe hypoglycemia | Repeated hypoglycemia, nocturnal hypoglycemia, severe hypoglycemia, or hypoglycemia unawareness | Urgent | These presentations increase morbidity and require prompt reassessment of treatment safety and glucose-monitoring strategies. | [40] |
| Pregnancy and preconception care | Pre-existing diabetes in women planning pregnancy, diabetes complicating pregnancy, or gestational diabetes requiring treatment intensification | Urgent / early co-management | Specialist care is recommended to optimize maternal glycemic control and reduce maternal–fetal complications. | [40] |
| Need for advanced therapies or diabetes technology | Consideration of continuous glucose monitoring, insulin pump therapy, complex injectable regimens, or clinician unfamiliarity with advanced glucose-lowering agents | Routine to semi-urgent | Referral is appropriate when treatment complexity exceeds the experience or infrastructure of family medicine practice. | [42] |
| Diabetic foot complications | Active foot ulcer, suspected Charcot neuroarthropathy, recurrent foot infection, ischemic foot, gangrene, or previous diabetes-related amputation | Urgent | Multidisciplinary specialist care is associated with better limb outcomes and lower amputation risk. | [43] |
| Progressive diabetic kidney disease | Increasing albuminuria, declining estimated glomerular filtration rate, rapid renal deterioration, or uncertainty regarding treatment selection in chronic kidney disease | Semi-urgent | Specialist consultation may help optimize cardio-renal- metabolic therapy and complication prevention. | [41,44] |
| Liver and metabolic comorbidity complicating diabetes care | Suspected NAFLD/NASH or MASLD, persistent liver enzyme abnormalities, severe obesity, or metabolic disease requiring integrated management | Routine | Diabetes specialists may assist with treatment prioritization and selection of therapies with metabolic and hepatic benefit. | [42,44] |

| | | | | |
|---|---|---|---|---|
| Complex multimorbidity | Diabetes with established cardiovascular disease, heart failure, chronic kidney disease, frailty, polypharmacy, or competing therapeutic priorities | Routine | Shared care may improve individualized, risk-based management in patients with multiple comorbidities. | [41,42] |
| Psychosocial and self-management barriers | Repeated nonadherence, diabetes distress, low health literacy, cognitive impairment, or inability to safely self-manage therapy | Routine | Multidisciplinary specialist input may s upport education, behavioral interventions, and long-term treatment adherence. | [41] |

## ABBREVIATIONS

HbA1c, glycated hemoglobin; NAFLD, nonalcoholic fatty liver disease; NASH, non-alcoholic steatohepatitis; MASLD, metabolic dysfunction-associated steatotic liver disease.

## FOOTNOTES

1. This table summarizes practical referral criteria for use in family medicine and primary care settings based on recent literature and multidisciplinary recommendations published between 2021 and 2026.

2. Referral urgency should be interpreted according to local healthcare infrastructure, specialist availability, and the patient's overall clinical stability.

3. In many cases, shared care between the family physician and diabetologist may be preferable to full transfer of care, particularly for chronic but complex presentations.

4. "Diabetologist" in this table refers broadly to an endocrinologist or diabetes specialist with advanced expertise in the diagnosis and management of diabetes and its complications.

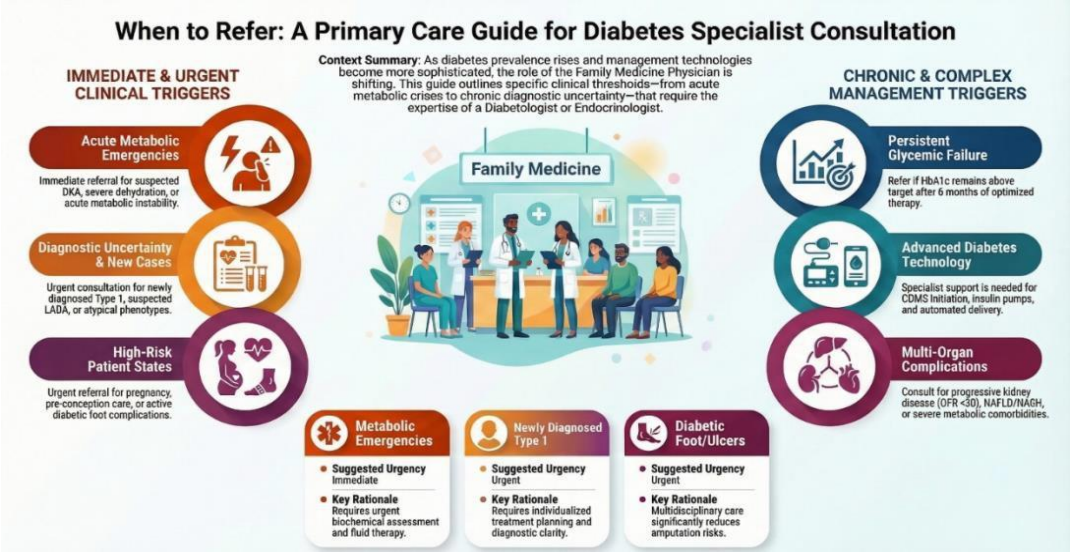


**Figure 1:** Visual abstract of the study

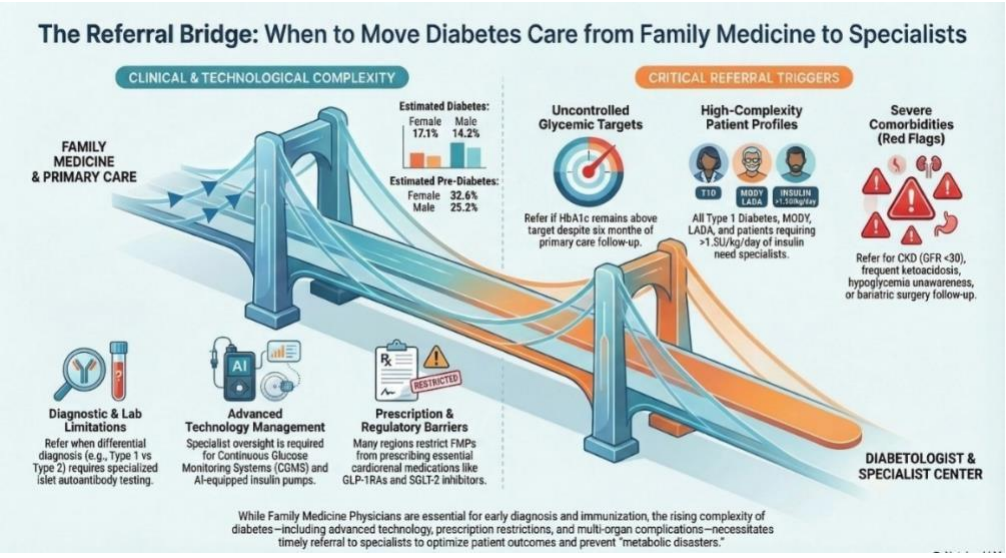


**Figure 2:** The Referral Bridge from Primary Care (Family Medicine) to Diabetologist

In conclusion; while diabetologists are having passionate to serve for PWD of any kind, even if multi-disciplinary approach is needed in many of the cases walking or being brought into clinics. We do not have enough endocrinologists to handle the burden of the diabetes epidemic all over the World. FMPs are trained well accordingly for when to refer these cases to secondary or tertiary centers, since their contribution to diabetes healthcare can not be underestimated owing to awareness of the public for this chronic metabolic condition, early diagnosis, performance of necessary immunizations, increasing compliance of PWD to healthcare fascilities.

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AI-based tools (NotebookLM) was used to assist in creating the graphical abstract. The outputs were reviewed, adapted, and integrated into my own work, which reflects my personal understanding and complies with the academic integrity policies of my institution.

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