Research Square

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Bridging Mind, Body, and Behavior : Psychosocial and Clinical Predictors of Lifestyle Modification Adherence Among Patients With Type 2 Diabetes in Urban Cameroon : A Cross Sectional Study in Yaounde Central Hospital

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Abstract

Background and Objectives : Type 2 diabetes (T2D) usually consider as a health issue specific to economically prosperous societies, is rising at a critical and significant rate in sub-Saharan Africa, particularly in urban areas undergoing rapid nutritional and epidemiological transitions. Adopting appropriate lifestyle habits is the cornerstone of preventing and managing this the disease. This study aims to analyze the psychosocial and clinical predictors of adherence to lifestyle modifications among T2D patients in urban area in Cameroon.

Methods : To achieve our goal a cross-sectional, correlational approach involving an active cohort of 351 patients followed over six months was conducted using the Diabetes Obstacles Questionnaire (DOQ) as a tool. Fisher's exact test, the Pearson's chi-square test, and multinomial logistic regression were performed using CS Pro 8.0 and R software. Logistic regression analyses controlling for age, sex, marital status, montly incomes, and educational attainment were carried out to identify the outcome variable of aherence with a statistical significance threshold of $p < 5\%$.

Results : 58% of women and 42% men filled the DOQ, with a mean age of 53.29 years (±10.06), and sex ratio of 0.72. A negative correlation was observed between economic and dietary barriers ($r = -0.608$), environmental and urban barriers ($r = -0.413$) ; social and cultural barriers ($r = -0.291$). The psychosocial and clinical predictors identified were self-efficacy (adjusted OR = 2.141; 95% CI: 1.097–4.179; $p = 0.026$); economic and environmental barriers (adjusted OR = 0.330; 95% CI: 0.231–0.471; $p = 0.001$); environmental/urban barriers (adjusted OR = 0.669; 95% CI: 0.468–0.956; $p = 0.027$); and the patients' level of knowledge regarding the disease (adjusted OR = 1.409; 95% CI: 1.011–1.963; $p = 0.043$).

Conclusions : Current findings support the hypothesis that adherence to therapeutic recommendations among people living with T2D in sub-Saharan Africa (SSA) depends on a synergy of actions: therapy and behavioral conditioning, with an emphasis on self-efficacy reinforced by financial support through the extension of universal health coverage to all chronic diseases, the creation of supportive environments (involving social support networks, stable ergonomic conditions, and sports facilities), and the continuous updating of their knowledge.

Background

Adopting a complex approach to health acknowledges that an individual's health status is determined by biological, psychological, social, spiritual, and cultural factors. These dimensions interact whether the focus is on mobilizing factors that positively influence health or on addressing negative determinants. Patients with type 2 diabetes (T2D) require care that integrates all dimensions of their lives. They also need psychosocial support throughout their lives, starting from the time of diagnosis. Some studies have suggested that the psychological profile of patients with type 2 diabetes plays a pivotal role in their self-management behaviors. Without patient adherence to effective treatments, disease control would remain suboptimal [**1**]. The commitment to objectively and effectively optimize the psychosocial aspects

of care for patients with Type 2 diabetes represents a challenge that healthcare systems in sub-Saharan Africa (SSA) must address by all possible means in the coming decades.

The burden of morbidity associated with T2D has been rising sharply for several years. A 2019 study found that the global age-standardized point prevalence of T2D was 5,282.9 cases per 100,000 inhabitants, with a mortality rate of 18.5 cases per 100,000 inhabitants, representing increases of 49% and 10.8%, respectively, since 1990 [**2**]. In SSA, the incidence of the disease is also significally rising at a critical and alarming rate. Data suggested the overall incidence was 14•6 (95% CI 13•4–16•0) cases per 1000 person-years in 2022 [**3**] with the regional prevalence of 4,5% in 2021 (with 24 million people affected by diabetes) while this prevalence is projected to increase untill 5,2% (55 million people) in 2045 [**2,3**]. Furthermore, the global age-standardized rate of disability-adjusted life years (DALYs) was 801.5 per 100,000 inhabitants in 2019, representing a 27.6% increase since 1990 [**2**]. Diabetes-related complications are expected to rise, leading to a deterioration in quality of life and, consequently, increased healthcare utilization and a heavier burden on health systems [**1**]. Demographic, sociocultural, and economic transitions are driving the increase in the risk and prevalence of diabetes and other non-communicable diseases [**5**]. Existing data suggest that outcomes in individuals in SSA with diabetes are currently suboptimal with over 300000 diabetes-related deaths before the age of 60 years in 2021 [**4**]. This situation is influenced by several factors, the underlying basis of which is psychosocial adherence to lifestyle changes. Studies have identified six factors acting as either barriers to or facilitators of T2D management : (i) cognitive-emotional factors, (ii) faith, (iii) barriers to behavior change, (iv) constraints and social support, (v) the healthcare provider-patient relationship, and (vi) awareness [**6**]. It is widely known that T2D patients are at high risk of decreased psychological wellbeing [**7**], and inadequate blood glucose control will impose an unsustainable burden of complications on already strained healthcare systems [**5**].

Managing type 2 diabetes requires ongoing investment in the psychosocial dimension—specifically, strengthening resources. This is why the French Diabetes Federation, a prime example of a social and psychological support network, views the mental health of people with diabetes as highlighting a profound societal issue: psychological well-being is no longer a luxury for these patients, but a necessity [**8**]. However, the provision of psychosocial support is generally inadequate due to the complexity of patient needs and the demands placed on healthcare systems [**1**]. Living with diabetes is not just about controlling blood sugar levels; it’s also means coping daily with the burden of the disease, including treatment demands, the fear of complications, frequent monitoring, and, at times, a profound sense of isolation. These constant demands create a significant mental load—one that is still too often underestimated within the care journey [**8**]. Diabetes affects the patient's psychosocial and mental well-being. The figures are striking: approximately 77% of people with diabetes have suffered from a mental health issue due to their condition, 79% have experienced diabetes burnout and 75% of people living with diabetes would like more emotional and mental well-being support [**9**]. 16% developed depression; 28% showed signs of anxiety; 49% consider managing medications to be an effort, and 56% think managing medical devices requires effort [**8**]. The main causes of diabetes-related mental health issues identified

were: (i) fear of complications (83%); (ii) fear of needles (55%); (iii) daily diabetes management (76%); (iv) stigma and discrimination (58%); [**9**] and (v) fear of hypoglycemia (22%)[**5**]

Methods

Study design, setting, and period

A hospital-based cross-sectional correlational study was conducted at the Yaoundé Central Hospital (Cameroon) over a two-month period (June–July 2026). This hospital is a referral center authorized to admit, diagnose, and monitor individuals with type 2 diabetes.

Target population, Sample size, inclusion criteria, and data collection tool

The study population comprised 351 patients drawn from an active caseload of 384 participated to the study. Participants had to be patients with type 2 diabetes who had been followed at Yaoundé Central Hospital for at least six months, were aged 18 or older, and had provided written or verbal consent. They also had to be free of cognitive impairments or Axis I psychiatric disorders (conditions that impair cognitive function and autonomy). Data were collected using a standardized sociodemographic questionnaire available in French and English and the Diabetes Obstacles Questionnaire [**10**].

Data collection

Data were collected using a structured, self-administered questionnaire We used consultation and follow-up logs to determine the actual active patient caseload and to identify "outpatient" and "inpatient" profiles. Eligible outpatients were recruited either in the waiting room—before or after their medical appointment—or via telephone (to schedule an appointment for the survey). Regarding inpatients, questionnaires were administered at the bedside with our systematic assistance to account for fatigue or reading difficulties.

Data management and statistical analysis

The active patient cohort consisted of 384 patients who were regularly followed up during the survey period. Twelve (12) declined to participate in the study, and 21 individuals filled out the data collection form incorrectly, rendering the data unusable during processing. Data were entered and cleaned using Microsoft Word, Microsoft Excel, and Epi-Data, then analyzed using CS Pro 8.0 and R. A descriptive univariate analysis was performed to determine frequencies, means, standard deviations, medians, and interquartile ranges. A bivariate analysis—using Pearson's chi-squared test or Fisher's exact test for qualitative variables, and Student's t-test or the Mann-Whitney test for quantitative variables—was conducted to examine associations between sociodemographic or clinical characteristics and the psychosocial and clinical factors influencing adherence to lifestyle recommendations. Multiple logistic regression was performed to identify independent predictors, with the threshold for statistical significance set at $p < 0.05$.

Ethical considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki [**11**] and Law No. 2022/008 of 27 April 2022 relating to medical research involving human subjects in Cameroon [**12**]. Ethical approval was obtained from the Center Regional Ethics Committee for Research on Human Health (Ref. N°2570 CRERSH/2026). Informed consent was obtained from all participants prior to their inclusion in the study. Furthermore, each participant received clear explanations regarding the study objectives, procedures, the voluntary nature of participation, and confidentiality measures. No personally identifiable information about the patients was collected.

Results

The major demographic and economic characteristics of T2D patients (N = 351) are presented on **Fig. 1**. The majority of those identified as T2D patients were women (sex ratio of 0.72). The age range of the participants was 50–60 years with a mean of 53.29 years (± 10.06). 37% had attained a university level of education, 26% were unemployed, 31.9% lived with less than 84 USD per month. SSA people experienced poverty in all ways. According to results of some studies, of the 1.25 billion inhabitants of Africa for whom data are available, 593 million (47%) are poor according to the MPI [**13**]. The aspect of poverty presented here is purely economic and monetary. There is much more significant aspect that forms the foundation of the aforementioned dimensions: the physical and psychological aspects of poverty [**14**]. It's known that the theoretical minimum cost of acceptable diabetes treatment—in the absence of complications—within the public sector amounts to approximately 29% of the per-patient gross domestic product, the total expenses reported by patients consumed an average of 24% of their income [**15**].

Figure 2 illustrates the origins of psychological and behavioral disorders in patients. They face a significant emotional burden on a daily basis. They dread complications, anxiety associated with hypoglycemia, and a fear of needles. They fear stigma and discrimination, while also contending with the challenges of daily diabetes management, organizational constraints, insulin injections, and the cost of devices and medications. This lifelong situation can lead to burnout, affect self-esteem, worsen the disease, and ultimately result in treatment abandonment. However, type 2 diabetes remains a condition in which patient involvement is essential; medical monitoring must be accompanied by daily medication and the adoption of lifestyle and dietary measures [**16**].

Several published studies show that knowledge about diabetes is linked to socioeconomic status, education level, duration of diabetes, age, sex, and family history [**17**]. Patients' knowledge about their illness is considered important in controlling diabetes and preventing complications [**18**]. Based on the data in Table 1, the majority of diabetic patients (97.2%) believe that fiber plays an important role in blood sugar control and that physical activity reduces the need for medication (94.8%) but poses a risk in the presence of a foot wound (97.0%). However, several gaps in knowledge persist among these patients. Indeed, only a small proportion (35.0%) identifies insulin as the primary cause of diabetes, while

another group (34.5%) has no idea about its origins. This state of psychological distress may explain the low level of self-efficacy shown in Fig. 3. The association between self-efficacy and the level of adherence was statistically significant. Patients with high self-efficacy demonstrated much better adherence : 37.7% showed moderate adherence and 3.9% good adherence, compared to only 11.6% and 0%, respectively, among those with low self-efficacy (Table 3). These results highlight the crucial role of the patient's confidence in their ability to adopt the prescribed behavioral changes

Adherence to treatment can face several barriers that do not always depend on the individuals concerned. As shown in Table 2, economic/nutritional barriers appeared to be the most significant, based on the median score (3/5). These were closely followed by environmental (2.5/5) and social (2/5) barriers. A negative correlation was observed between all categories of perceived barriers and the overall adherence score. Economic and dietary barriers showed the strongest negative correlation (r = -0.608), followed by environmental and urban barriers (r = -0.413) and social and cultural barriers (r = -0.291) (Table 4). These results indicate that the greater the perceived barriers, the lower the level of adherence.

Multinomial logistic regression incorporating all barriers significant in the bivariate analysis

After adjustment using multinomial logistic regression, four factors emerged as independently associated with the level of adherence : self-efficacy, economic and dietary barriers, environmental and urban barriers, and the level of knowledge (**Table 5**).

Discussion

Data on the global prevalence of diabetes indicates that Africa is increasingly affected [**19**]. In this study, we evaluated the interplay between psychosocial dynamics, clinical characteristics, and behavioral adherence to lifestyle modifications among individuals with type 2 diabetes (T2D) in an urban setting in Cameroon. Our key findings demonstrate a statistically significant negative correlation between perceived barriers and the overall adherence score. These barriers encompass economic and dietary, environmental and urban, and social and cultural factors. The greater the perceived barriers, the lower the level of adherence. Psychosocial factors—specifically family and professional support, a sense of self-efficacy, and perceived socioeconomic distress—exert a major influence on adherence to dietary recommendations and long-term engagement in physical activity.

Diabetes is a chronic condition for which a permanent cure remains impossible [**20**]. Its management relies on regular monitoring and the adoption of lasting changes in dietary habits [**21**]. The project imply self-efficacy. Perceived self-efficacy is, above all, a mental construct. It is reinforced by a cluster of beliefs, the individual's environment, the objective and subjective benefits derived from the situation. It emerges as a crucial element that impacts engagement in self-care behaviors among patients with type 2 diabetes [**22**]. Our study highlights diabetes self-efficacy as a paramount mediator of lifestyle modification adherence. Patients with higher self-efficacy scores consistently achieved better compliance with recommended dietary regimens and structured physical activity. It is proposed that self-efficacy expectations determine the initiation of coping behavior, the effort expended, and persistence in

the face of obstacles and aversive experiences [**23**]. Diabetes as a chronic disease requires lifelong medical treatments and life-style adjustment. Hence, it requires dedication towards self-care behavior in multiple domains [**24**]. Diabetes management self-efficacy is known as a positive predictors of quality of life in diabetic patients [**22**]. Diabetes self-efficacy and self-management are significantly linked to better glycemic control and improved diabetes outcomes [**25**], low self-efficacy may contribute to inadequate glycemic control [**26**]

Social and cultural obstacles that hinder adherence to lifestyle changes among diabetic patients were identified in our study. Knowledge regarding the origins of the disease played a role, as these perceptions redefine the care pathway. Social and cultural dimensions are crucial when seeking to understand certain human phenomena in Africa. Illness, just like health and death, is socially and culturally determined. These perceptions often drive how individuals determine their own care pathways in this context. Examining the role of sociocultural factors in diabetes management requires looking at perceived causes, the origins of the disease, and the sequence of responses planned to address it—particularly given that African populations live within a communal framework where solidarity is a fundamental existential value. Here, meals are shared within the family; regardless of health status, families typically share meals prepared from the same ingredients. It is perhaps at this juncture that the challenge of managing diabetes arises. Some studies have highlighted the relationship between sociocultural factors and diabetes control. They identified a lack of social support, as well as religious and cultural beliefs, as primary obstacles [**27**]. If the spirituality and religiosity can positively influence diabetes self-management by providing motivation, coping strategies, social support, and guidance that fosters healthy behaviors, some religious and cultural aspects—such as beliefs regarding medication—can also pose challenges or act as barriers to diabetes self-management [**28**]. Cultural practices vary widely, encompassing the use of traditional medicine following diagnosis, self-medication, social mobility (such as changing residence), negative impacts on educational progress, and reliance on various types of healthcare facilities (university hospitals, private clinics, and traditional healers) [**29**]. Therapeutic adherence, dietary choices, physical activity, and the use of complementary or alternative medicine can be influenced by sociocultural factors. Furthermore, cultural beliefs and social norms shape the understanding of the etiology and management of diabetes, as well as how symptoms are perceived and managed [**28**].

Economic and dietary barriers showed a negative correlation (r = -0.608) with lifestyle changes among people with diabetes in our study. It is worth noting that the African environment offers a wide variety of dietary options. Food choices often consist of generic, undifferentiated local dishes, regardless of an individual's clinical condition. Meals are consumed in informal eateries that cater to all budgets. Sub-Saharan Africa includes several countries classified by the World Bank as low- and middle-income economies; both the Human Development Index and the general poverty index in the region are low. And yet, the consumption of high-quality, culturally acceptable staple foods could play a crucial role in preventing diabetes [**30**]. Individuals with low socioeconomic status had a significantly higher risk of developing type 2 diabetes [**31**], while those with high income performed two times more self-care than less income (OR-2.42;95%CI 1.04–17.95) [**24**]

Regarding environmental and urban obstacles, modernity contributes significantly to improving human quality of life. It offers opportunities to experience well-being and aspire to greater longevity. From a practical standpoint, modernity enhances the ergonomics of production, facilitates travel, and provides a diverse range of food options and other basic conveniences. However, some observers argue that despite this comfort, many people struggle to adopt healthy lifestyles, as these conveniences encourage sedentary behavior and overeating [**32**]. Rapid urbanization and the modernization of lifestyles have fostered the emergence of a "diabetogenic" ecosystem. This urban environment presents a combination of physical, social, and economic constraints that shape and dictate patients' daily choices while imposing a relentless pace on human life. Beyond infrastructure, physical environmental exposures play a direct pathophysiological role in disrupting glucose metabolism. Recent studies indicate that air pollution induces adipose tissue inflammation and oxidative stress, thereby impairing insulin sensitivity. Nighttime urban traffic noise disrupts sleep architecture, leading to elevated cortisol and adrenaline levels—factors that contribute to morning hyperglycemia. The thermal vulnerability of diabetic patients (due to impaired sweating and altered vascular tone) increases the risk of dehydration and metabolic decompensation during heatwaves [**33**]. The development of type 2 diabetes is influenced by the built environment—"human-modified environments, including housing, schools, workplaces, highways, urban sprawl, access to services, leisure activities, and pollution." It fosters the development of diabetes by affecting access to physical activity and inducing stress, which disrupts sleep cycles [**34**].

Conclusion

At the conclusion of our study, and in light of the extensive available literature, it appears essential to reconcile spiritual, physical, and behavioral dimensions when managing the demands of living with diabetes. Observing the daily lives of these patients reveals a multitude of challenges, with psychosocial distress compounding the burden of their everyday reality. In sub-Saharan Africa, the prevalence of type 2 diabetes has reached epidemic proportions. Several factors are involved, and these same factors hinder disease management among those affected. These include: (i) economic and dietary obstacles; (ii) environmental and urban obstacles; and (iii) social and cultural obstacles. These factors are negatively correlated with overall adherence to lifestyle changes.

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Tables

Tables 1 to 5 are available in the Supplementary Files section.

Figures

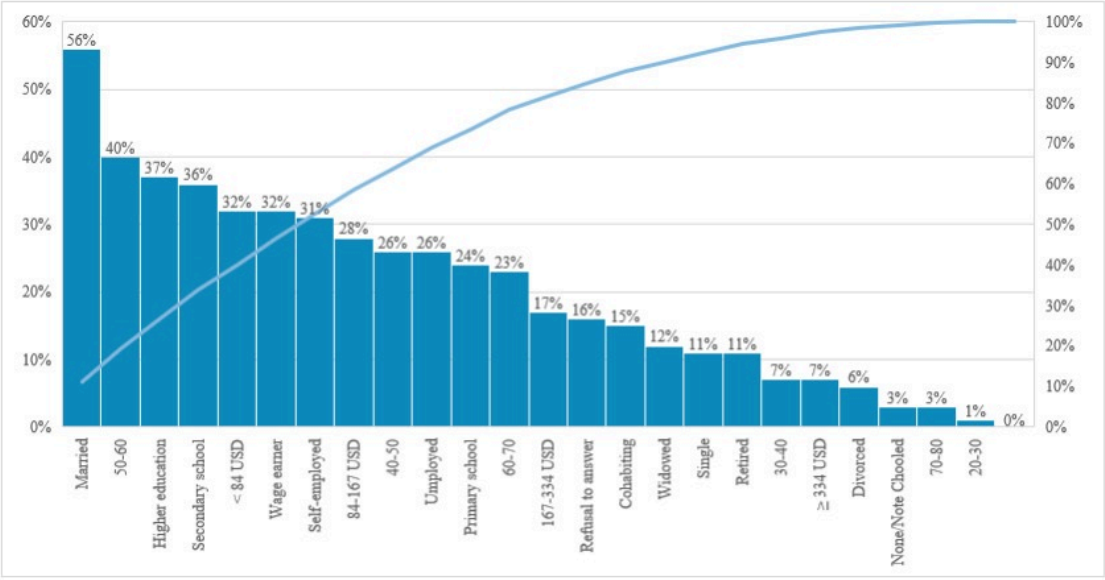


Figure 1

Sociodemographics and economics characteristics of DT2 Patients

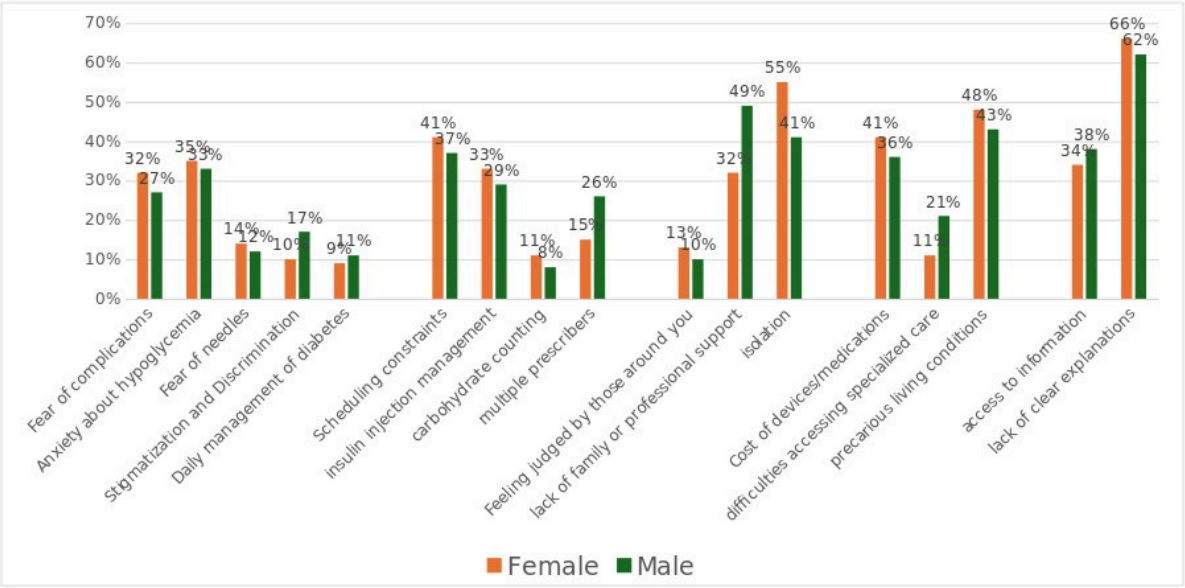


Figure 2

Origins of psychological and behavioral disorders in patients with Type 2 diabetes adapted from DOQ

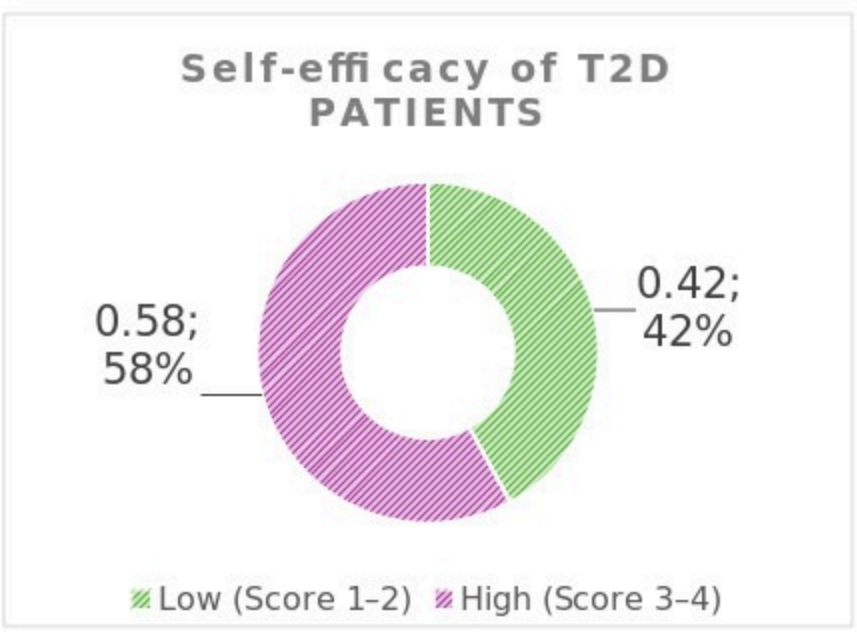


Figure 3

Self-efficacy level of patients with type 2 diabetes

Supplementary Files

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- Table1.jpeg
- Table2.jpeg
- Table3.jpeg
- Table4.jpeg
- Table5.jpeg