



An-Najah National University

Faculty of Graduate Studies

**ASSOCIATION BETWEEN TREATMENT
SATISFACTION AND URINARY
INCONTINENCE AMONG DIABETIC
PATIENTS: A CROSS-SECTIONAL STUDY
FROM PALESTINE**

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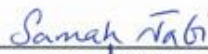
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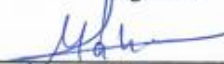
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Dedication

My family is the source of my inspiration for success and enthusiasm throughout my life, and I would like to dedicate this thesis to them.

To my husband, who never fails to inspire me with his devotion and unconditional support. I am extremely blessed to have someone in my life who supports me.

Also, I dedicate my work to my supervisor and my university.

Finally, to my sweet baby girl " Leen", you bring joy to my heart and make me feel so happy. You are everything to me, I love you mommy.

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I want to thank my family, especially my husband, at this time. In addition, my sincere gratitude goes out to my friend outside of work, and to everyone else I did not mention.

Shaharзад

Declaration

I, the undersigned, declare that I submitted the thesis entitled:

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I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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Abstract

Background: Type 2 diabetes mellitus (DM) is a chronic metabolic disorder. Such diseases can harm and cause daily life complexities related to mortality and other disorders. Therefore, this disease greatly affects daily routines in life and influences health quality. Furthermore, satisfaction with treating patients' daily life and routines is a frequent and important aspect. Thus, research is needed to find further such associations with treatment satisfaction.

Objectives: This study will investigate the correlation between treatment satisfaction and its domains with urinary incontinence (UI). Additionally, the researcher checked the variables of predictability of the confounding demographics and urinary incontinence to predict treatment satisfaction.

Methodology: A cross-sectional study was performed to recruit diabetic patients from primary care centers in Palestine between the first of June 2022 and the first of October 2022. Four hundred diabetic patients were surveyed to fill in sociodemographic questions, urinary incontinence (ICIQ-UI-SF), and treatment satisfaction questionnaire (TSQM 1.4). The findings were analyzed for descriptive statistics, correlations, and regressions between satisfaction treatment and urinary incontinence. The analysis was performed using the statistical package of social sciences (SPSS).

Results: The study included four hundred diabetic patients from primary centers in the northern part of West Bank. The patients ranged in age between 18 and 89 years, with 210 males and 190 females. The patients were asked to answer ICIQ-UI-SF, and the

findings showed that 101 out of 400 patients (25.25%) had urinary incontinence. These patients' UI severity ranged from slight (15%), moderate (65%), severe (18%), and very severe (3%). In addition, the patients were asked to fill in the TSQM (1.4) to assess their satisfaction with the treatment. Analysis of the questionnaire revealed four domains' scores out of 100; the higher the score, the higher the satisfaction. For instance, domain effectiveness was 66.125 ± 16.6 , domain side effects was 94.68 ± 17.9 , domain convenience was 68.11 ± 14.57 , and global satisfaction was 67.17 ± 16.46 . However, the correlation analysis between treatment satisfaction and urinary incontinence was insignificant ($p > 0.05$). This means the patients did not correlate their urinary incontinence status and satisfaction with treatment. The scores were statistically significant with the level of education ($p < 0.05$) and the use of sitagliptin ($p < 0.05$). In addition, the quantity of leaked urine and incontinence status were significantly correlated with ICIQ scores ($p < 0.05$). Additionally, regression analysis showed that urinary incontinence status could predict treatment satisfaction.

Conclusions: The study findings showed that diabetic patients' satisfaction with their treatment is not correlated with their urinary incontinence status. However, more studies must be conducted with interventional designs to explore the relations further.

Keywords: diabetes; satisfaction; urinary incontinence; treatment; Palestine; TSQM; ICIQ; questionnaire.

Chapter One

Introduction

1.1 Background

Diabetes mellitus is one of the most chronic diseases around the globe (1). It is a disease that requires the patient to adhere to many medications, a restricted diet, physical exercise, and a healthy lifestyle (2). All these measures are needed to prevent the complications of the disease, including microvascular (nephropathy, retinopathy, and neuropathy) and macrovascular (diabetic foot, cardiovascular diseases) complications (3). Its management is complex, requiring ongoing clinical management, lifestyle changes, and self-care. Hence, diabetes is a disease that mandates patients to be in constant follow-up, periodic visits to the physician, and lab testing.

Diabetes is one of the most chronic diseases, one of the most public health issues, and the fifth most common cause of mortality worldwide (4). Although it has a long and detailed history, type 2 diabetes mellitus (DM) is a constant and chronic metabolic disorder. This disease harms and causes complexities in daily life related to mortality and other disorders. Therefore, this disease greatly affects daily routines in life and influences health quality. Furthermore, satisfaction with treating patients' daily life and routines is a frequent and important aspect. Therefore, more research is needed to explore associations between treatment satisfaction, DM, and daily urinary aspects (5).

The connection between how satisfied patients are with their diabetes treatment, how well they manage their diabetes, and their daily experience with urinary problems shows that diabetes needs more comprehensive way of treatment. This means that healthcare providers need to care for more than the medical part, but also the overall well being of diabetic patients. In this approach, clinical pharmacists are vital because they can help in making diabetes care better.

Clinical pharmacists are integral members of the healthcare team, they collaborate with physicians, nurses, and other healthcare professionals to ensure that diabetic patients receive the most effective, safe, and patient-tailored medication plan. Clinical pharmacists can conduct comprehensive medication reviews, assessing the anti-diabetic drugs, evaluating potential drug interaction and other medication related concerns.

Furthermore, they work closely with patients to enhance their understanding of diabetes medications, emphasizing the importance of adherence to drugs.

In the context of treatment satisfaction, clinical pharmacists are ideally positioned to address patients' concerns regarding medication tolerability, side effects, and regimen complexity. Clinical pharmacists can collaborate with patients to explore alternative therapies if needed and make adjustments to optimize the treatment outcomes.

Some evidence in the literature suggests that patients with DM have a greater risk of developing urinary incontinence (UI) (6). The fact that DM can contribute to urinary dysfunction (7) might show the need for its treatment and influence on daily life disruptions. Diabetic neuropathy can affect much of the population with DM, more precisely, approximately 33 percent. Such a condition can disrupt the nerve supply to the bladder and cause urinary leakage. This may increase involuntary bladder contractions and decrease bladder sensation (8).

In terms of UI, clinical pharmacists can play a vital role in educating patients about the potential connection between their drugs and conditions. They can review patients' medication profiles to identify any drugs that may exacerbate UI (9).

The role of treatment satisfaction in diabetes care cannot be ignored, as it serves as a cornerstone that can significantly affect the adherence to prescribed therapies, self-care practices, and overall well-being. The satisfaction with treatment involves not only medications tolerability, but also convenience of treatment regimens, and the perceived effectiveness of interventions. Hence, exploring the complicated connection between treatment satisfaction, diabetes management, and urinary symptoms. Suggest for the need for more comprehensive care.

This study aims to delve deeper into the relationship between treatment satisfaction, diabetes management, and urinary incontinence among diabetic patients. By exploring how these factors interact, we aim to better understand how treatment satisfaction influences diabetes management and whether it is associated with an increased risk of UI. Additionally, as a clinical pharmacist is conducting the current study, the role of clinical pharmacist in enhancing treatment satisfaction.

1.2 Literature Review

1.2.1 Diabetes

A metabolic disorder known as type 2 diabetes mellitus is characterized by hyperglycemia and altered lipid metabolism and is caused by islet cells' inability to secrete enough insulin in response to various degrees of overeating, and inactivity, resulting in overweight or obesity and insulin resistance. Due to this disorder's rapidly rising global incidence, the terrible harm it can cause to numerous body parts, and the direct and indirect expenditures, it has a tremendous burden (10).

The introduction of insulin in clinical practice has opened a new era for the treatment of diabetes (11). Patients' lifestyles, starvation, and many kinds of diets had ceased, as well as several infections, and helped the patients improve their quality of daily life. Unfortunately, only in the last century have physicians started to understand and investigate the importance of diet as part of treating the disease (12).

To improve the quality of treatment or patients' satisfaction, we need to look more deeply into the outcomes related to medications in their treatment (13). In addition, supporting this approach is the fact that patient satisfaction with treatment is associated with improving quality of life and the number of problems that can come with it (5).

When pharmacists are involved in the management of diabetes mellitus (DM) in Arab nations, patients tend to have a better understanding of their condition, adhere more closely to both pharmaceutical and nonpharmacological treatments, and eventually have better glycemic, lipid, and blood pressure control. Further carefully planned long-term studies are strongly advised to validate the advantages of pharmacist interventions in treating diabetes mellitus (DM) (14).

A study in Saudi Arabia reviewed the role of clinical pharmacists in diabetes, and their analysis highlighted the crucial role that clinical pharmacists play in managing diabetes patients in various settings around the world. Recognizing and amending laws to permit shared practice agreements between doctors, pharmacists, and other allied health professionals is urgently necessary. These mutual agreements would make it possible for individuals with common health issues to receive nonphysician health professionals' services more efficiently (15).

Based on these studies, as a pharmacist, we need to investigate the aspects of diabetic patients that influence their quality of life in Palestine.

1.2.1.1 Treatment of diabetes

The treatment of diabetes mellitus, particularly type 2 diabetes (T2D), encompasses a wide range of therapeutic approaches aimed at achieving and maintaining optimal blood glucose control. These approaches include insulin therapy and diverse range of oral medications tailored to individual patient needs. Additionally, the management of diabetes in specific situations, such as during acute stress or hospitalization, require careful consideration of treatment strategies to ensure stable glycemic control. (16).

Insulin therapy

One of the fundamental pillars in the management of diabetes is insulin therapy which plays a pivotal role in regulating blood glucose levels. Insulin is utilized not only in patients with diabetes type 1 but also in certain situations for individual's with T2D. In type 1 diabetes, insulin therapy is essential as it replaces the insufficient or absent endogenous insulin production (10).

In the context of T2D, insulin therapy becomes necessary when lifestyle modification, oral medication, or other non-insulin injectable medication provide insufficient in achieving target blood glucose or HbA1c. Patients with T2D may require exogenous insulin during periods of acute stress, such as surgery or serious illness, to ensure tight control of their blood sugar levels. (10).

Moreover, insulin therapy is sometimes combined with oral medication or non-insulin injectable medication to attain more precise glycemic control. This combination approach allows healthcare providers to tailor treatment plans according to individual patient requirements and the progression of the diseases (16).

Oral medications

Diabetes management is enriched by a large group of oral medications, each belonging to distinct categories with unique mechanisms of action. These categories include, sulfonylurea, biguanide, thiazolidinediones, dipeptidyl peptidase-4 (DPP-4) inhibitors,

sodium-glucose cotransporter-2 (SGLT2) inhibitors and alpha-glucosidase inhibitors, among others.

Sulfonylurea, including glyburide and glipizide, stimulate insulin secretion by the pancreas, while biguanide like metformin reduce glucose production in the liver and enhance insulin sensitivity in peripheral tissues. Thiazolidinediones, such as pioglitazone, improve insulin sensitivity in muscle and adipose tissues and decrease liver glucose production. DPP-4 inhibitors, like sitagliptin, enhance insulin release by blocking hormone degradation, and SGLT-2 inhibitors like dapagliflozine reduce glucose reabsorption by the kidney leading to glucose excretion. Alpha-glucosidase inhibitors, including acarbose and miglitol, slow carbohydrate digestion in the intestine. Incretin-based therapies, comprising Glucagon-like peptide-1 (GLP-1) receptor agonist and DPP-4 inhibitors, mimic and enhance the action of incretin hormone, regulating insulin and glucagon secretion, and promoting satiety.

These oral medications offer tailored options to address individual patient needs, to achieve optimal glycemic control while considering factors like side effects, weight management, and overall health.

Treatment initiation for T2D often begins with a single oral medication tailored to the patient's specific needs. However, as the disease progresses, dual therapy-combining two different medications- becomes increasingly common to achieve optimal glycemic control. The selection of medications is highly individualized, taking into consideration factors such as the patient's overall health, kidney function, risk of hypoglycemia, and potential side effects. (16).

Hospitalization and medication management

During hospitalization, individuals with diabetes may require adjustments to their medication regimens to ensure stable glycemic control. In many cases, oral medications are temporarily discontinued, and insulin therapy is initiated to prevent fluctuations in blood glucose.

Continuous monitoring of blood glucose levels is crucial for patients on oral medications. Regular assessments allow healthcare providers to evaluate the effectiveness of the treatment plan and make necessary adjustments to medications and

dosages. Patients are also educated on self-monitoring practices and life style modifications to complement medication therapy. (16)

1.2.2 Urinary incontinence

Urinary incontinence is a condition characterized by involuntary urine leakage. It often occurs in conjunction with other bothersome lower urinary tract symptoms, such as the urgent need to urinate, increased frequency during the day, and waking up at night to urinate (nocturia) (17). The condition can be classified into various types:

1. Stress urinary incontinence (urethral under activity):

In stress urinary incontinence (SUI), the urethra and/or urethral sphincters cannot provide enough resistance to prevent urine flow from the bladder when there is an increase in intra-abdominal pressure (which occurs when the bladder, an intra-abdominal organ, is under pressure). Activities that increase intra-abdominal pressure, such as exercising, running, lifting, coughing, and sneezing, can cause urine leakage.

Risk factors for SUI in women include pregnancy (the risk increases with an increased number of pregnancies), vaginal delivery during childbirth, menopause, cognitive impairment, obesity, and increasing age. Risk factors for SUI in men include prostate disease, especially in cases where there is a history of prostate surgery or radiation therapy, a history of urinary tract infections, physical limitations such as impairments in daily activities, neurologic diseases like stroke, spinal cord injury, impaired cognition, constipation, depression, diabetes, and sleep apnea, as well as increasing age (17).

2. Urinary Incontinence (Bladder Over-activity):

In urge urinary incontinence (UUI), the detrusor (bladder) muscle is overactive and contracts inappropriately during the filling phase (17).

3. Overflow Urinary Incontinence (Urethral Over-activity and/or Bladder Underactivity)

Overflow urinary incontinence (OUI) is an infrequent type of urinary incontinence that can occur in both sexes. In OUI, the bladder is always full but cannot empty completely, causing urine to leak out periodically. This can be caused by either urethral over-activity or bladder underactivity. In cases of bladder underactivity, the detrusor muscle may

have weakened to the point where it cannot contract voluntarily, resulting in incomplete emptying of the bladder and leaving large volumes of residual urine after urination (14).

4. Functional UI

Functional incontinence is a type of urinary incontinence that is usually not caused by intrinsic urinary tract problems but rather by extrinsic factors. Some of these factors include immobility caused by pain, traction, or the use of non-portable medical devices, limited access to toilet facilities or delayed access, cognitive impairment, UTIs, postmenopausal atrophic urethritis and vaginitis, diabetes mellitus, diabetes insipidus (low antidiuretic hormone [ADH]), pelvic malignancy (which can cause obstruction by exerting pressure on urinary tract structures), constipation or fecal impaction, congenital malformations, CNS disorders that lead to decreased consciousness, and depression (which can cause apathy, making it difficult for patients to recognize and respond to their incontinence) (17).

5. Mixed and UI

It is a combination of bladder over activity and urethral underactivity.

The International Continence Society (ICS) defines UI as involuntary urine leakage or the involuntary urine occurrence. Such condition can include any patient with even one episode of UTI in his lifetime (18). Recent reports indicate the need for the UI condition to be described in more depth using specifics such as frequency, severity, risk factors, hygienic social influence, and its effects on satisfaction and quality of life. Another important aspect that should be considered is whether the patient seeks help (19). Such detailed reasoning and in-depth diagnosis are required to encourage and produce more treatments than their basis on symptoms, comparison of the results, and effective doctor-patient communication. Studies have indicated that UI increases with age. UI is not a static condition and should be seen as dynamic, in which incidence rates are linked to remission (20).

UI can have a great impact on the costs of health care. The situation can impose a large financial burden on the parties involved: patients, their families, and even healthcare professionals. In addition, there are great risk factors and impacts on the patient's quality

of life. A small group of patients seeks help for their struggle with UI (19), which can influence their satisfaction and manner of the treatments they receive, their accessibility, and help-seeking behavior to treat their condition.

1.2.3 Treatment of urinary incontinence

UI is often a distressing condition that can significantly impact individual's quality of life. There are various treatment options available, ranging from lifestyle changes and behavioral therapy to medical interventions and surgical procedures. The choice of treatment depends on the type and severity of urinary incontinence, as well as individual patient preferences and medical history.

Life style and behavioral interventions often form the first line of treatment. Pelvic floor muscle exercises, known as Kegel exercises, can strengthen the muscles responsible for bladder control, aiding in the management of stress and urge incontinence. Additionally, bladder training involves gradually increasing the time between bathroom visits to extend bladder capacity and reduce urgency.

Dietary modification, like limiting caffeine and spicy foods, can alleviate symptoms for some individuals, as can weight management to reduce stress on the bladder. Scheduled toileting helps establish routine bathroom visits for those with urge incontinence.

Medications play a significant role in managing incontinence, with anticholinergic drugs, these drugs help relax an overactive bladder and reduce symptoms of urge incontinence. Common medication include oxybutynin, tolterodine, and solifenacin.

Beta-3 adrenergic agonists, Mirabegron, is a medication that relaxes the bladder muscle and increases its storage capacity. It is often used to treat overactive bladder.

Topical estrogen therapy, for postmenopausal women, topical estrogen therapy can help improve the strength and elasticity of the urethra and vaginal tissues, potentially reducing stress incontinence.

Medical devices, such as pessaries and urethral inserts, offer non-invasive support for the bladder and urethra. Neuromodulation therapies like sacral neuromodulation and peripheral tibial nerve stimulation, can help regulate bladder function. Bulking agents are injected to bolster the tissues around the urethra, primarily benefiting those with stress UI. For some cases of severe stress incontinence, surgical options like sling procedure, bladder neck suspension, or artificial urinary sphincters are considered.

Catheters, intermittent or indwelling, may be required for individuals with overflow incontinence to manage bladder emptying. Biofeedback and electrical stimulation techniques help individuals regain control over pelvic muscles and bladder function. Complementary therapies like acupuncture, herbal remedies, and hypnotherapy are explored by some, but their effectiveness varies.

While treating patients with urinary incontinence, patient education and counseling can address the emotional and psychological aspects of living with UI. Individuals experiencing UI should collaborate with healthcare professionals to develop a personalized treatment plan that offers relief, enhances quality of life, and improves well-being.

- Medical devices
- Surgery

1.2.4 Diabetes and urinary incontinence

Diabetes typically results in higher glucose levels, less blood flow, and nerve damage. However, it may also have an impact on bladder function and sensory function. Due to these causes, associations between diabetes and urinary tract infections and frequent urination are common.

Hence, diabetes and urine incontinence are chronic, expensive diseases impacting millions of Americans (21). However, these persistent illnesses frequently coexist in the same patient, increasing financial and social expenses and lowering quality of life. A number of articles under the headings of prevalence or risk factors have discussed the link between urine incontinence and diabetes. Researchers and clinicians should be aware of this connection while developing procedures or giving clinical treatment since it is so powerful.

A prospective study investigated the relationship between the onset of female urine incontinence and type 2 diabetes mellitus (DM). It was determined that DM raises the risk of female urine incontinence on its own. This result indicated that prolonged DM duration was related to a higher risk of incontinence (22).

Furthermore, a recent study aimed to estimate the association between UI and glycemic control in adult women. However, the prevalence among the population was 52.9%. Women with reasonably well-controlled diabetes are more likely to experience stress incontinence when their glycemic control deteriorates (23).

Many studies have investigated the linkage between UI and diabetes mellitus. Danforth et al. evaluated the associations between type 2 diabetes and the various types of urinary incontinence in 71,650 women aged 37 to 79 years to better understand the etiological relationship between the two conditions. According to their results, type 2 diabetes may have a particular impact on urge incontinence. They concluded that there is a gap, and it has to be confirmed by more studies to identify the connections between these illnesses (24).

Diabetes leads to continence in several ways, and studies have revealed these mechanisms. For instance, diabetes medications can cause symptoms of urine incontinence. The medicine pushes blood glucose into the urine in an effort to control excessive blood sugar levels. As a result, the bladder may become inflamed and experience incontinence.

Medication for diabetes that may induce urinary symptoms or incontinence includes SGLT2 inhibitors (25).

These novel oral drugs for the treatment of type 2 diabetes are sodium-glucose cotransporter-2 (SGLT2) inhibitors, sometimes referred to as gliflozins. They function by preventing the kidneys from reabsorbing glucose, which lowers blood sugar.

The three agents that are now on the market are empagliflozin, dapagliflozin, and ertugliflozin. Due to their advantages, they are rapidly replacing metformin as one of the most frequently recommended diabetic treatments (26).

1.2.5 Satisfaction of patients

One patient-reported outcome is patient satisfaction. However, because patient satisfaction is combined with their beliefs and values, the concept of satisfaction is not one-dimensional. Patients' perceptions are their opinions and knowledge, but their values are their norms or expectations. As a result, there is a great deal of individual

diversity; as standards and opinions are subjective, what is tolerable to one person may not be tolerable to another. There are different definitions of satisfaction provided by various authors. Some consider satisfaction an attitude, while others see it as feelings and emotions. Yet, some define satisfaction as the degree to which healthcare services meet patients' expectations. Regardless of the definition, patients' opinions are essential in evaluating the quality of medical care, especially in the context of the patient-centered care approach, which has gained popularity in recent years. In this approach, patients' perspectives and preferences are given significant consideration in decision-making processes related to their health.

Although studies have suggested that patient satisfaction is influenced by health status, few studies have looked at how different health status indicators affect satisfaction. Therefore, HbA1c levels alone should not be used to determine the effectiveness of diabetes therapy; instead, patient-reported outcomes, including patient satisfaction, wellness, and quality of life, should be taken into consideration.

However, patient satisfaction with treatment might be affected by the quality of life and suffering they feel from these effects of the drug or not. For example, nephropathy is one of the complications that diabetic patients eventually experience if they have uncontrolled diabetes. Urinary incontinence is one of the symptoms of this complication. Hence, patients could feel this symptom and feel unsatisfied about the treatment, believing their suffering is because of it. This is where the study builds its hypothesis and research questions.

1.2.6 Role of clinical pharmacist in diabetes and UI

Clinical pharmacists play a crucial role in the management of diabetes and UI, two prevalent healthcare conditions that affect millions of patients worldwide. Clinical pharmacists are important in optimizing medication therapy, educating patients about their medication, and collaborating with other healthcare providers to achieve glycemic control and prevent complications. They work closely with patient to ensure they understand how to take their diabetes medications, monitor blood glucose levels and manage any side effects or adverse events. Additionally, clinical pharmacists can provide valuable counseling of lifestyle modifications, including dietary choices and exercise, which are integral to diabetes management. Moreover, they have a vital role in

monitoring for drug interaction and adjusting drug plans to accommodate other medical conditions or medications patients are taking at the same time (15).

On the other hand, clinical pharmacists contribute significantly to improve patient's quality of life by offering comprehensive pharmaceutical care. They assess the underlying causes of UI, which can range from medication side effects to comorbidities, and collaborate with healthcare teams to identify the causes. Clinical pharmacists have a role in reviewing and adjusting medication regimens that may exacerbate UI symptoms or interact with drugs used for UI management. They educate patients on the appropriate use of UI drugs, potential side effects, and life style medications that can help alleviate symptoms. Moreover, they can assist in selecting the most suitable UI products, ensuring patient's comfort in managing the conditions (27).

Patients satisfaction in the management of diabetes and UI depends on the approach of care. Clinical pharmacists are integral members in the healthcare team. Hence, effective communication and education for the cornerstone of patient satisfaction, as pharmacists who deliver clear information and empower patients with important aspects about their drugs. Empathy and compassion in dealing with the emotional challenges associated with these conditions needs trust which enhances satisfaction (28).

Furthermore, when patients experience improvements in their health and quality of life, their satisfaction naturally increases. Involving patients in decision making and treatment plans also contributes to satisfaction. Moreover, clinical pharmacists bridging between other healthcare providers to ensure the continuity of care.

1.3 Definition of terms

- Diabetes: also known as diabete mellitus (DM), is a chronic metabolic disorder characterized byu elevated blood glucose levels due to either insufficient insulin production by the pancreas or the body's inability to effectively use insulin It is a complex condition that requires lifelong management involving medications, diet, exercise, and lifestyle modifications. (29).
- Urinary incontinence: is a medical condition characterized by the involuntary loss of urin. It can manifest in various forms, including stress UI (loss of urine during activities that increase intrabdominal pressure), urge UI (involuntary leakage due to overactive bladder), overflow UI (incomplete bladder emptying leading to periodic

leakage), functional UI (loss of urine due to external factors such as mobility issues or cognitive impairment) and mixed UI (a combination of multiple types) (30, 31).

- Patient satisfaction: it refers to an individual's subjective assessment and emotional response to their healthcare experience. It encompasses their opinions, beliefs, values, and expectation regarding the care they receive. Patient satisfaction is a multidimensional concept that can be influenced by various factors, including treatment outcomes, quality of life, perceived effectiveness of interventions, and the alignment of healthcare services with patient preferences (32).
- Clinical Pharmacist: a healthcare professional with specialized training in medication management and pharmaceutical care. They play a crucial role in optimizing medication therapy, educating patients about their medications and collaborating with other healthcare providers to ensure safe and effective treatment. Clinical pharmacists can conduct medication reviews, assess drug interactions, and provide counseling to patients on medication adherence, side effects, and life style modifications. They are integral members of the healthcare team, contributing to improved patient outcomes and satisfaction. (15)
- Neuropathy: is a condition characterized by nerve damage, which can result in various symptoms, including, tingling, numbness, and pain. Diabetic neuropathy is a common complication of diabetes.
- Quality of life: it refers to an individual's overall well-being and satisfaction with various aspects of their life, including health, social relationships, and daily functioning. It is often used as an outcome measure in healthcare research. (5)

1.4 Problem Statement and Rationale of the Study

A comprehensive analysis of the existing literature reveals a substantial evidence indicating that patients with diabetes, regardless, exhibit a higher susceptibility to urinary incontinence. This phenomenon not only encompasses various types of UI, such as stress, urge, or mixed incontinence, but also highlights the multifactorial nature of diabetes related complications. The predisposition of diabetic patients to UI can be attributed to a complex mix of factors, including neuropathy, altered bladder function,

and obesity, which collectively underscore the urgency of addressing this issue in diverse population.

It becomes evident that targeted investigation is needed to ascertain the specific implication of UI within the Palestinian population with diabetes mellitus. The Palestinian context introduces unique sociocultural, economic, and healthcare dynamics that may contribute to the prevalence and management of diabetes related complications, making it imperative to tailor research efforts to this specific demographic. Understanding how UI affects the daily lives, health-seeking behaviors, and overall well-being of Palestinian diabetic patients will provide valuable insights into the broader challenges faced by this population.

Despite the substantial burden posed by diabetes and its associated complication in Palestine, there exists a noticeable void in the literature regarding the treatment satisfaction levels among diabetic patients. This lack of information affects our ability to deliver patient-centered care effectively. The extent to which diabetic patients in Palestine are adherent with their treatment regimen, access to healthcare services, and the overall management of their condition remains largely unknown. It is paramount that we embark on an in-depth exploration of this aspect to better understand the multifaceted nature of diabetes care in Palestine.

By undertaking the present study, which aims to investigate the sophisticated relationship between diabetes mellitus and patient treatment satisfaction. This research seeks to elucidate how various factors, including access to medication, physician patient communication, and the effectiveness of therapeutic interventions, influence the satisfaction levels of diabetic patients. Consequently, the outcomes of this study are expected to inform healthcare policymakers, practitioners, and providers, enabling them to tailor pharmaceutical care strategies to meet the unique needs and preferences of Palestinian diabetic patients.

Ultimately, this holistic approach to the healthcare delivery enhances the overall quality of life for diabetic patients residing in Palestine, offering them not only improved treatment outcomes, but also a higher degree of well-being.

1.5 Research Questions

- What is the prevalence of urinary incontinence among diabetic patients in Palestine?
- What is the association between satisfaction to treatment and urinary incontinence?
- What are the main factors associated with treatment satisfaction among diabetic patients?

1.6 Objectives of the Study

1.6.1 General Objectives

The objective of the study is to determine the relationships between treatment satisfaction and urinary incontinence among diabetic patients.

1.6.2 Specific Objectives

- To determine the prevalence of urinary incontinence among diabetic patients in Palestine.
- To assess the association between treatment satisfaction and urinary incontinence.
- To reveal the factors associated with treatment satisfaction among diabetic patients.
- To check the predictability of the confounding demographic variables and urinary incontinence to predict treatment satisfaction.

1.7 Significance of the Study

Gaining a deeper comprehension of the factors that influence urinary incontinence and treatment satisfaction among individuals with diabetes can provide valuable insights to urologists regarding the complex nature of this disease. Moreover, it can help in preventing or minimizing urological complications associated with diabetes mellitus. Thus, clinical pharmacists can engage in effective communication with patients, leading to the development of appropriate anti-diabetic regimens and management plans. This, in turn, can enhance patients' satisfaction levels with their treatment and improve their overall health outcomes. Therefore, it is imperative to identify the variables affecting urinary incontinence and treatment satisfaction in this population to ensure optimal care delivery and improve patients' quality of life.

Evaluating these associations among type 2 diabetes can help improve patients' treatment. Therefore, understanding treatment satisfaction can improve healthcare professionals' understanding of treating and approaching patients more helpfully.

1.8 Outline of thesis

The thesis is organized into several chapters. Chapter one serves as the introduction providing an overview of diabetes and its complex management, emphasizing treatment satisfaction and urinary incontinence. It also conducts an extensive literature review, covering diabetes management, treatment satisfaction. Chapter two outlines the research methodology employed in the study and the data collection instruments. Chapter three presents the study's findings and their implication, in addition the analysis of the gathered data. Chapter four discusses the findings of the study relative to the existing literature. In addition, it offers a conclusion summarizing the key findings and providing recommendations for improving diabetes care while recognizing the role of clinical pharmacists.

Chapter Two

Methodology

2.1 Study design

A cross-sectional study design between June 2022 and October 2022.

2.2 Study setting

Patients were approached from the Primary Health Care centers in Nablus City, West Bank, Palestine. We visited the largest government primary care centers in Nablus Balata and Almakhfeya centers.

2.3 Study population

The study population for the current were patients diagnosed with Diabetes Mellitus in Palestine.

2.4 Sampling procedure and sample size calculation

The current study recruited 400 patients, and this specific sample size was determined based on a comprehensive literature review. An extensive review of existing studies that focused on treatment satisfaction and health-related quality of life among patients with type 2 diabetes.

Through this literature review, it was found that consistent evidence suggesting that a sample size of approximately 400 participants is considered adequate and appropriate for studies involving the target population of patients with type 2 diabetes. These previous studies have demonstrated that this sample size provides sufficient statistical power to detect meaningful relationships and draw reliable conclusions (5).

2.5 Inclusion and exclusion criteria

Eligible patients to participate in the study:

1. 18 years of age and older and agree to participate in the study
2. Diagnosis of type 2 DM.
3. Start treatment for at least 6 months
4. No known cognitive impairment.

Participants were excluded if they:

1. Have DM type 1
2. Have type II DM but have not started treatment at all
3. Type II DM with less than six months of treatment
4. Have any known cognition problem, such as recognizing their medication or similar aspects.

2.6 Data collection instrument

The data collection instrument is a questionnaire divided into three sections: sociodemographic and clinical information, International Consultation on Incontinence Questionnaire - Urinary Incontinence Short Form (ICIQ-UI-SF), and Treatment Satisfaction Questionnaire for Medication (TSQM). Appendices B and C includes the data collection form used.

2.6.1 Sociodemographic and clinical data

The first part of the data collection includes data about the patient's age, gender, weight, height past medical history, disease status, family and social history, and drug history.

2.6.2 ICIQ-UI SF

The International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI SF) tool was used to evaluate UI (Appendix A – Section 2). It is an easy tool to assess the effect of UI on patient's quality of life. It identifies the severity, frequency, and overall impact of the incontinence and causes of the symptoms.

The survey basically consists of four questions, each question focuses on a certain aspect of urinary incontinence. The first question asks about the frequency of incontinence episodes in the past four weeks, with options ranging from never to more than once a day. The second question asks about the amount of urine lost during an episode of incontinence. The choices of the second question are from a few drops to a large amount of urine. The third question explores how much incontinence affects the patients' life with a scale from zero to 10, with 10 being a high impact on life. Eventually, the fourth questions make the patients identify possible causes of their incontinence, such as coughing or exertion.

To calculate the ICIQ-UI SF score, one should sum the scores for each question (Q1 out of 5 + Q2 out of 6 + Q3 out of 10). Hence, the ICIQ-UI SF is a scoring scale that ranges from 0 to 21, indicating the severity of urinary incontinence. The scores are categorized into: Mild incontinence (1 to 5), Moderate incontinence (6 to 12), Severe (13 to 18), and Very Severe (19 to 21). The last question in the questionnaire does not receive a score as it was a subjective question.

The tool allows the clinician to quickly and easily assess the urinary incontinence status of a patient, especially diabetic patients. It provides information about the severity and symptoms. It can be applied to tailor management plans according to each patient's needs. Furthermore, it enables effective communication between the healthcare provider and the patient, which turn into better satisfaction towards treatment and anti-diabetic medications (33).

2.6.3 TSQM version (1.4)

The researcher evaluated treatment satisfaction of patients by employing the Arabic version of the Treatment Satisfaction Questionnaire for Medication (TSQM 1.4), [Appendix A – Section 3]. It is acquired from Quintiles Strategic Research Services. This extensively validated and reliable questionnaire consists of 14 items and is organized into four domains: Effectiveness (questions 1–3) that assess patients' perception on how well the medication manages his case. Side Effects (questions 4–8) that measure the extent of any adverse effect. Convenience (questions 9–11) that measures how easy or difficult for the patient to take his medications. And Global Satisfaction (questions 12–14) assesses the overall patient satisfaction towards the treatment. The domain scores of TSQM 1.4 were computed following the guidelines provided by its creators, with a detailed explanation available in other literature.

The TSQM has a scale from 0 to 100 for each category to measure satisfaction. The higher the score, the higher the satisfaction. There are specific guidelines for calculating and interpreting the results from each patient to determine his satisfaction. In order to calculate each one, we need to follow the following:

- Effectiveness score = $[(Q1+Q2+Q3)-3]/18 * 100$
- Side effects score if the answer is No the score is 100

- Side effects score If the answer is Yes = $[(Q5+Q6+Q7+Q8)-4]/16 * 100$
- Convenience score = $[(Q9+Q10+Q11)-3]/18 * 100$
- Global satisfaction score = $[(Q12+Q13+Q14)-3]/14 * 100$

The algorithm was adapted from the literature (34).

2.7 Data collection process

At the primary care centers, patients with diabetes were approached and asked to participate in the study. Patients who voluntarily agreed to participate filled in the informed consent to complete the entire questionnaire. Patients were asked to fill in the questionnaire (self-administered), however, patients who were illiterate or had difficulties were helped by doing face-to-face questionnaire

First, participants were asked demographic questions (age, sex, smoking status, BMI, residency, marital status, duration of diabetes, comorbid diseases, insulin use, medications, and diabetes drugs).

Subsequently, participants were asked to complete 6 questions about urinary incontinence (using the ICIQ-UI SF questionnaire).

In addition, participants were asked about treatment satisfaction by filling out the TSQM version II questionnaire. The questionnaires ICIQ-UI SF and TSQM are internationally validated questionnaires and as shown in the literature they have been used vigorously. Hence, the current study went directly to collecting and analyzing data.

2.8 Study variables

The variables used are age, sex, smoking status, BMI, duration of diabetes, and comorbid diseases. In addition, insulin use, medications used, and diabetes drugs used. In addition, the variables of the scales of TSQM version II subscales and the ICIQ-UF SF scores.

2.9 Ethical considerations

All aspects of the study protocol, including access to and use of patient clinical information, were authorised by the Institutional Review Boards (IRB) and local health authorities. (Appendix C)

2.10 Statistical analysis

The data collected in this study was analysed using the Statistical Package for Social Sciences (SPSS). Continuous variables are presented as means $\pm$ SDs, while categorical variables are presented as frequencies and percentages. To assess the normality of the variables, the Kruskal–Wallis test was used.

The main objective of the study is to investigate the relationship between treatment satisfaction and urinary incontinence among diabetic patients in Palestine, as well as to determine the impact of sociodemographic and clinical factors on this relationship. To achieve this objective, a correlation matrix is conducted to measure the correlations between the subscales of the TSQM version II and the scores of the ICIQ-UF SF.

Moreover, a multiple linear regression is used to predict treatment global satisfaction. In this regression analysis, the dependent variable was global satisfaction, while the independent variables included age, duration of diabetes, smoking status, BMI, sex, number of comorbid diseases, insulin use, number of medications, and diabetes drugs, which served as confounding demographic factors. Additionally, the score for questions 3, 4, and 5 of the ICIQ-UI SF was included as another independent variable. A p-value of < 0.05 was considered significant.

Chapter Three

Results

This study recruited patients with diabetes in primary healthcare centers in Nablus, Palestine. This section provides the findings from the data collected and analysed to achieve the objectives of the study.

3.1 Sociodemographic results

This study surveyed 400 patients with type 2 diabetes. Most of the patients were male (52.5%, n=210), while most were female (47.5%, n=190), with a ratio of 1.1:1. The participants had a mean age of 58.4 ± 13.8 years with a range of 18 to 89 years. However, most patients were 55 to 65 years of age (37.5%, n=150), followed by patients above 65 years of age (33%, n=133). Most patients did not receive higher education despite most of them living in the city. The majority of the participants were housewives (67.6%), and 89 (34.8%) had secondary education levels. The vast majority of the patients are of income less than 5 thousand Israeli shekel (more than 90%). Additionally, smoking was not common among the participants (53.8%, n=215). Participants' sociodemographic results are shown in Table 3-1.

Table 3.1*Sociodemographic results of participants (n=400)*

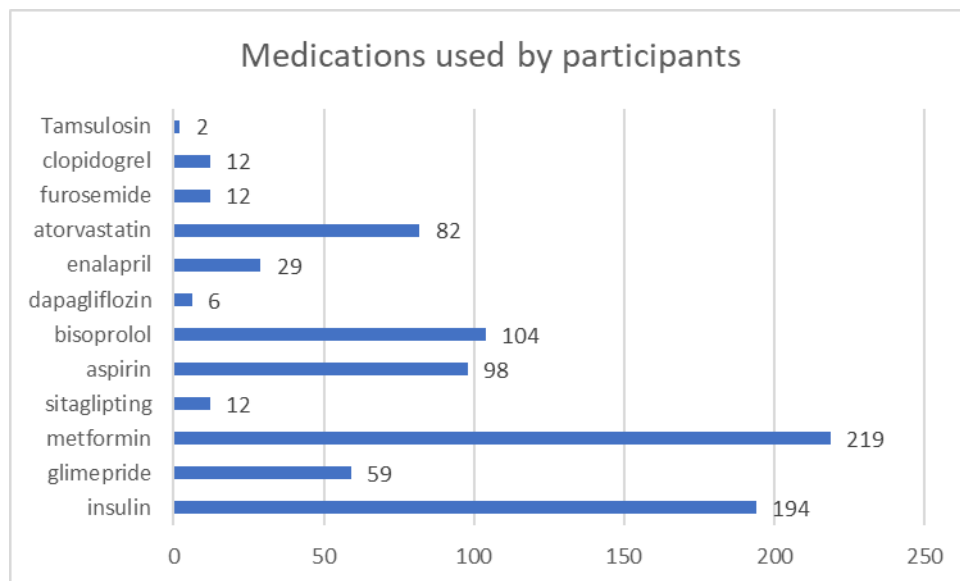
Item	Frequency	Percent
Age Category		
Under 25	13	3.3
25 to 35	17	4.3
35 to 45	25	6.3
45 to 55	63	15.8
55 to 65	150	37.5
above 65	132	33
Mean Age	58.4 ± 13.8 years	
Age Range	18 – 89 years	
Gender		
Male	210	52.5
Female	190	47.5
Education		
Bachelor	43	10.8
Diploma	32	8
Illiterate	16	4
PhD	10	2.5
Primary	83	20.8
Tawjihi	216	51
Income		
2000-5000 Sheckel	181	45.3
Less than 2000 Sheckel	183	45.8
more than 5000 Sheckel	34	8.5
Marital Status		
Divorced	9	2.3
Married	280	70
Single	46	11.5
Widow	65	16.3
Location		
City	239	59.8
Refugee	21	5.3
Village	137	34.3
Work		
Employee	46	11.5
Housewife	180	45
I do not work	69	17.3
Private	105	26.3
Family member having diabetes		
No	150	37.5
Yes	249	62.3
Smoker		
Ex-smoker	53	13.3
No	215	53.8
Yes	132	33
Treating with herbs		
No	364	91
Yes	36	9

3.2 Clinical characteristics of the participants

All the recruited patients had diabetes, and the duration of diabetes ranged from 1 year to 55 years, with a mean of 11.7 ± 9.1 years. Additionally, the patients were asked about the drugs that they were taking. Figure 3-1 below presents the frequency of drugs used by the sample. Hence, the study investigated the satisfaction of patients towards all of their medications.

Figure 3.1

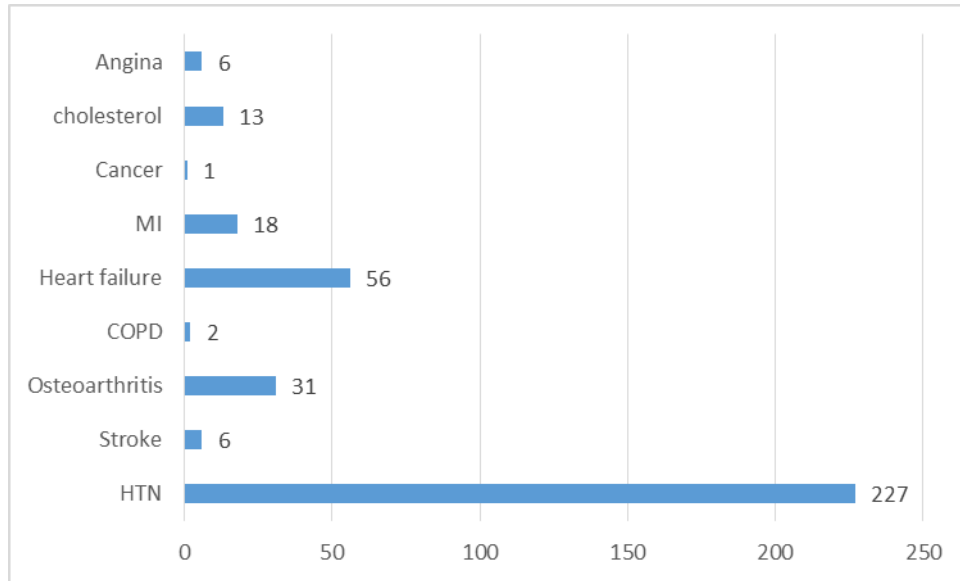
Medications used by patients



The patients had various comorbidities, such as hypertension, hyperlipidemia, gout, and others, as shown in Figure 3-2.

Figure 3.2

Disease comorbidities



3.3 Urinary incontinence (ICIQ)

The patients were asked about having urinary incontinence or not using the questionnaire (International Consultation on Incontinence Questionnaire-ICIQ). The first question of this questionnaire asks the patients whether they have UI. The results of these questions are shown in Table 3-2.

Table 3.2

ICIQ - Frequency of leaking urine (n=400)

How often do you leak urine?	Frequency	Percent
Never	299	74.8
About once a week	52	13.0
Two to three times a week	18	4.5
Once a day	23	5.8
Several times a day	2	.5
All the time	6	1.5
Total	400	100.0

Table 3.3*ICIQ - Volume of leaked urine (n=400)*

How much urine do you usually leak?	Frequency	Percent
None	299	75.0
a small amount	57	14.0
a moderate amount	32	8.0
a large amount	12	3.0
Total	400	100.0

- **UI effect on life**

In ICIQ-UI SF, there is a question asking the patients about the effect of UI on their life. The effect on life was asked with a scale from 0 to 10, where 0 is the least effect on life and 10 as the highest effect on life. Among the patients who had urinary incontinence (n=101), the mean score of effect on life ranged from 1 to 10 with a mean of 5.303 ± 2.483 .

- **ICIQ scores**

As explained in section 2.6.2 regarding ICIQ score calculation, the ICIQ score was calculated for each patient. After calculating the scores, I presented the frequency of patients who got same scores, the frequency ICIQ-UI scores are shown in Table 3-4.

Table 3.4*ICIQ score*

ICIQ Score	Frequency	Percent
0	299	74.8
3	4	1.0
4	2	.5
5	9	2.3
6	10	2.5
7	9	2.3
8	7	1.8
9	9	2.3
10	10	2.5
11	11	2.8
12	9	2.3
13	2	.5
14	8	2.0
15	3	.8
16	3	.8
17	2	.5
19	1	.3
20	1	.3
21	1	.3

The scores ranged from 0 (for participants with no UI) to 21, with an average score of 9.69. The ICIQ-UI scores are classified into four categories, namely, slight, moderate, severe, and very severe, as shown in Table 3-5.

Table 3.5

Urinary incontinence severity classes according to ICIQ scores

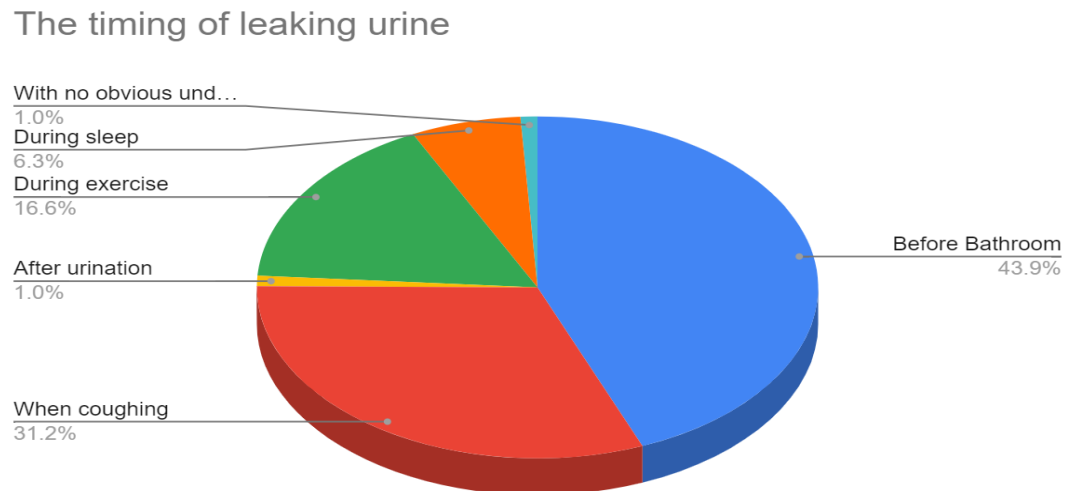
Severity	Score range	Frequency	Percentage
Slight	1 – 5	15	14.85%
Moderate	6 - 12	65	64.36%
Severe	13 - 18	18	17.82%
Very severe	19 - 21	3	2.97%

The final question in ICIQ asks the participants about the time of leaking urine, where the participants can choose more than one answer. The answers of the participants are shown in Table E-1.

The figure below shows a pie chart of the timing of leaking uring among diabetics. The largest group representing 43% of patients leaked urine before bathroom. This means almost half of the patients in the study reported leaking urine before they were able to get to the bathroom. Other times of the day when urine leakage can occure include during sleep (6.3%), during excercise (16.6%), when coughing (31.2%) and after urination (1.0%).

Figure 3.3

The timing of leaking urine



3.4 Treatment Satisfaction (TSQM)

Satisfaction with treatment was assessed using the TSQM questionnaire; the questionnaire involves 14 items. As explained in section 2.6.3, the 14 items follow specific equations to calculate the score of four domains: satisfaction towards effectiveness, side effects, convenience, and global satisfaction. The higher the score is, the better the satisfaction; the results are shown in Table E-2.

The Figure below shows the results of a survey on patient satisfaction with their medication. The survey asked respondents to rate their satisfaction with the medication on 10 different aspects, including its ability to prevent or treat their condition, how well it relieves symptoms, and how easy it is to use.

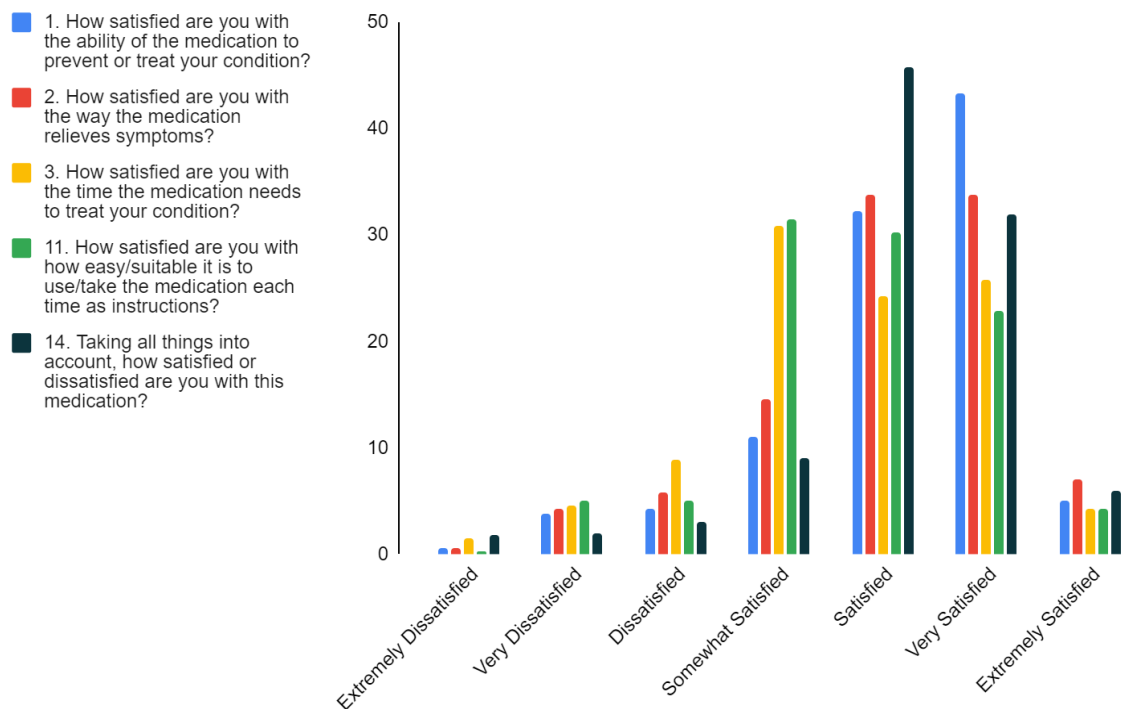
The figures indicates that most respondents were satisfied with their medication. However, there were some areas where satisfaction was lower. For example, only 38% of respondents were very satisfied with the medication's ability to prevent or treat their condition. This suggests that there is still room for improvement in this area.

Other areas where satisfaction was lower included the time it takes for the medication to work (36%) and the side effects (34%). This suggests that patients would like to see these aspects of their medication improved.

Overall, the results of the survey indicate that patients are generally satisfied with their medication. However, there are some areas where satisfaction could be improved. By addressing these areas, healthcare providers can help to ensure that patients are getting the most out of their medication.

Figure 3.4

Levels of Patient satisfaction using TSQM



3.5 Hypothesis testing

The hypothesis was tested to test the normality of the data. The ICIQ categories were tested compared to the TSQM domains using the Kruskal–Wallis test (Table 3-6); the results retained the null hypothesis among all groups, indicating that the data were normally distributed.

Table 3.6*ICIQ categories and TSQM domains*

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Domain Effectiveness is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.693	Retain the null hypothesis.
2	The distribution of Domain Side Effects is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.109	Retain the null hypothesis.
3	The distribution of Domain Convenience is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.720	Retain the null hypothesis.
4	The distribution of Domain Global satisfaction is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.546	Retain the null hypothesis.

Note. Asymptotic significances are displayed. The significance level is .05

Additionally, the normality was tested for the TSQM domains and their distribution on whether a patient has UI or not using the Kruskal–Wallis test. The four domains were normally distributed, as shown in Table 3-7.

Table 3.7*Hypothesis testing of TSQM domains and UI status*

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Domain Effectiveness is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.942	Retain the null hypothesis.
2	The distribution of Domain Side Effects is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.584	Retain the null hypothesis.
3	The distribution of Domain Convenience is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.525	Retain the null hypothesis.
4	The distribution of Domain Global satisfaction is the same across categories of ICIQ-categories.	Independent-Samples Kruskal-Wallis Test	.392	Retain the null hypothesis.

Note. Asymptotic significances are displayed. The significance level is .05.

3.6 Correlations

3.6.1 Correlation of ICIQ and TSQM with sociodemographic and clinical characteristics

The ICIQ and TSQM scores were analyzed using SPSS to test their correlation, which is presented in Tables E-3, E-4.

Table E-3 presents the sociodemographic distribution of participants among the ICIQ scores. The analysis was performed in two ways. First, the ICIQ scores of all participants were analysed to determine whether they had incontinence. The results showed that there was mostly no statistical significance between the scores and the sociodemographic characteristics of the patients. However, the scores were statistically significant with the level of education ($p < 0.05$) and the use of sitagliptin ($p < 0.05$). In addition, the quantity of leaked urine and incontinence status were significantly correlated with ICIQ scores ($p < 0.05$).

On the other hand, Table E-4 shows the results of analysing the sociodemographic distribution of participants among the total satisfaction score. The total situation was based on the analysis of TSQM domains, namely, Global satisfaction. None of the participants included in this study had a correlation between their satisfaction towards their treatment and their sociodemographic characteristics except level of education.

There is evidence to suggest that level of education may be a significant factor influencing satisfaction towards treatment among diabetic patients with urinary incontinence. Specifically, participants with a bachelor's degree had a significantly lower mean outcome score of 6.25 (SD = 1.54) compared to participants with other levels of education, who had mean scores ranging from 9.93 (SD = 1.11) to 10.71 (SD = 1.18).

This difference in mean scores was found to be statistically significant ($p < 0.001$)

This means that individuals with a higher level of education may be less satisfied with their treatment compared to those with lower levels of education.

Regarding sitagliptin, the table shows that 88% of the participants did not take sitagliptin, while only 4.25% of the participants took sitagliptin. The use of Sitagliptin

was found to be significantly associated with patient satisfaction towards treatment for diabetic patients with urinary incontinence ($p=0.005$). Patients who used Sitagliptin had a slightly higher satisfaction score (mean score of 10.25) compared to those who did not use it (mean score of 9.85). However, it's important to note that the sample size for those who took sitagliptin is quite small (only 12 participants).

Furthermore, although not statistically significant at the conventional level of $p<0.05$, there was a trend towards patients with a higher number of comorbid diseases having a lower satisfaction score ($p=0.077$). Patients with no comorbid diseases had the highest satisfaction score (mean score of 9.95), while those with four comorbid diseases had the lowest satisfaction score (mean score of 8.50).

Eventually, the urinary incontinence status of the patients was also found to be significantly associated with satisfaction with treatment ($p<0.01$). Patients who reported never having urinary incontinence had the highest satisfaction score (mean score of 10.05). In contrast, those who reported experiencing it once a day had the lowest satisfaction score (mean score of 8.50).

3.6.2 Correlation between ICIQ and TSQM

Table 3-8 displays the results of a correlation analysis examining the relationship between satisfaction domains (effectiveness, side effects, convenience) with each other and with ICIQ scores among diabetic patients who have urinary incontinence.

The results show that effectiveness, convenience, and global satisfaction are positively correlated with each other, indicating that patients who rate the treatment as more effective, convenient, and satisfactory are more likely to rate it positively overall. Additionally, side effects and convenience are weakly positively correlated, indicating that patients who find the treatment more convenient may also experience fewer side effects.

The ICIQ is weakly negatively correlated with effectiveness, side effects, and convenience, indicating that patients who rate the treatment more negatively on these factors are more likely to report urinary incontinence symptoms.

Table 3.8*Correlations between ICIQ and TSQM scores*

	Spearman's rho	Effectiveness	Side Effects	Convenience	Global satisfaction	ICIQ
Effectiveness	Corr. Coeff.		.130**	.225**	.452**	-0.15
	Sig. (2-tailed)		0.01	0.00	0.00	0.14
	N		400	400	400	101
Side Effects	Corr. Coeff.	.130**		0.07	.119*	0.10
	Sig. (2-tailed)	0.01		0.17	0.02	0.34
	N	400		400	400	101
Convenience	Corr. Coeff.	.225	0.07		.358**	0.11
	Sig. (2-tailed)	0.00	0.17		0.00	0.26
	N	400	400		400	101
Global satisfaction	Corr. Coeff.	.452**	.119*	.358**		0.06
	Sig. (2-tailed)	0.00	0.02	0.00		0.54
	N	400	400	400		101
ICIQ	Corr. Coeff.	-0.15	0.10	0.11	0.06	
	Sig.(2-tailed)	0.14	0.34	0.26	0.54	
	N	101	101	101	101	

Table 3-9 presents the correlation between ICIQ and TSQM if we make the correlation analysis for the whole 400 participants. In other words, we included patients who did not have urinary incontinence and had a score of 0.

Table 3.9

Correlation coefficient between treatment satisfaction and ICIQ score (N=400)

Satisfaction Domain	Spearman's rho	ICIQ score
Domain Effectiveness	Correlation Coefficient	-0.015
	Sig. (2-tailed)	0.772
Domain Side Effects	Correlation Coefficient	-0.014
	Sig. (2-tailed)	0.739
Domain Convenience	Correlation Coefficient	-0.024
	Sig. (2-tailed)	0.638
Domain Global satisfaction	Correlation Coefficient	0.021
	Sig. (2-tailed)	0.675

Based on Table 3-9, which includes a larger sample size of 400, there is no significant correlation between the ICIQ Score of all participants and the domains of treatment satisfaction, including effectiveness, side effects, convenience, and global satisfaction. This suggests that the severity of urinary incontinence symptoms does not appear to be related to patient satisfaction with their treatment.

However, this finding is in contrast to Table 3-8, which included only the participants who had urinary incontinence and showed a weak negative correlation between ICIQ and global satisfaction.

3.7 Regression analysis

Table 3-10 presents the results of a multiple regression analysis conducted to investigate the relationship between treatment satisfaction and urinary incontinence among diabetic patients in Palestine.

The Model Summary table for the regression analysis provides information about the overall fit of the regression model. The model included six independent variables: "Domain Effectiveness," "Domain Side Effects," "Domain Convenience," "Urinary Incontinence," "Age Groups," and "ICIQ Score.". In addition, the "Domain Global satisfaction" is considered the dependent variable.

The "R" column in the table clarifies the correlation coefficient between the independent and the dependent variable. It has been found that the correlation coefficient is 0.642, that indicates a moderate positive correlation between the dependent variable and the independent variable.

The "R Square" column shows the proportion of the variance in the dependent variable that can be explained by the independent variables. In this case, the R square value is 0.412, indicating that approximately 41.2% of the variance in "Domain Global satisfaction" can be explained by the independent variables in the model.

Hence, the results in this table suggest that the independent variables in the model can explain a moderate proportion of the variance in the dependent variable.

Table 3.10

Regression analysis of ICIQ and TSQM

Model Summary						
Model		R	R Square		Adjusted R Square	Std. Error of the Estimate
1		.642 ^a	.412		.403	12.7182
a. Predictors: (Constant), ICIQ Score, Domain Convenience, Domain Side Effects, Age Groups, Domain Effectiveness, Urinary Incontinence						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.446	4.784		2.602	.010
	Domain Effectiveness	.556	.040	.563	14.037	.000
	Domain Side Effects	.077	.036	.084	2.113	.035
	Domain Convenience	.181	.045	.160	4.038	.000
	Urinary Incontinence	-2.920-	1.242	-.182-	-2.352-	.019
	Age Groups	-.595-	.618	-.038-	-.964-	.336
	ICIQ Score	.612	.273	.173	2.241	.026
a. Dependent Variable: Domain Global satisfaction						

Furthermore, Table 3-10 shows the results of a regression analysis that assess the relationship between several factors (ICIQ score, effectiveness domain, side effects domain, age groups, convenience domain, and urinary incontinence status) and the dependent variable which is the domain global satisfaction.

The results indicate that domain effectiveness, side effects, and convenience have statistically significant positive effects on Global satisfaction, as it is obvious from the positive t value. On the other hand, urinary incontinence status has a statistically significant effect on satisfaction, but the effect is negative as obvious from the negative t value. In other words, the worse the urinary incontinence status the lower the satisfaction.

Furthermore, the age groups and ICIQ scores did not have statistically significant associations with global satisfaction domain.

Based on the results, it can be found that (Domain effectiveness), (Domain side effects), (domain convenience) and (ICIQ score) showed a significant impact on Global satisfaction. This means that diabetic patients who perceive their treatment as effective, experience fewer side effects, and find their medication easy to use, and have lower ICIQ score are more likely to have higher levels of satisfaction with their diabetes treatment.

On the other hand, the presence of urinary incontinence has statistically significant adverse impact on global satisfaction, which means that diabetic patients who experience urinary incontinence are expected to have lower satisfaction levels with their diabetes treatment.

Age groups among the patients did not have statistically significant effect which means that age does not have an effect on the satisfaction level of diabetic patients towards their treatment.

Chapter Four

Discussions and Conclusions

4.1 Overview

The present study investigated how satisfied diabetic patients with urinary incontinence were with their treatment. Participants were gathered from primary care clinics in Palestine and were requested to complete a survey comprising three sections: sociodemographic and clinical details, ICIQ-UI-SF, and TSQM (v1.4). The ICIQ-UI-SF, which was part of the survey, examined patients' urinary incontinence status and how it impacted their lives, whereas the Treatment Satisfaction Questionnaire for Medication (TSQM) was used to evaluate patients' satisfaction with their treatment. The study's results were analysed to determine the association among variables.

4.2 Sociodemographic factors and their influence on Diabetic patients in Palestine

The distribution of age groups demonstrated a relatively even spread, with a majority falling into 56-65 years and more than 65 years categories. Suggesting that diabetes affects a wide range of age. Similarly, gender distribution is fairly balanced, indicating both males and females are affected. However, it is essential to note that considerable portion of the population falls within the secondary level of education, highlighting potential implications for health literacy.

When examining factors like monthly income and marital status, no significant differences are observed among patients, indicating that diabetes affects individuals across various income levels and marital statuses. Additionally, smoking status reveals that more patients are nonsmokers, although the difference is not great. The use of herbal remedies is relatively low among the study population, and most patients fall within the overweight and obese BMI categories, which is consistent with diabetes often being associated with these conditions.

Concerning the management of diabetes, most patients are on combination therapy for diabetic drugs, suggesting that significant proportion requires multiple medications to control their condition. Furthermore, the duration of diabetes varies with relatively even spread across different timeframes signifying the chronic nature of the disease.

In terms of specific medications, a majority of patients are on Glimepiride, Metformin, Sitagliptin, and Dapagliflozin, with varying proportions taking these drugs.

Glimepiride and Metformin are among the most commonly used medications, indicating their popularity and effectiveness in managing diabetes, along with their cheap prices in Palestine.

Sitagliptin and Dapagliflozin, while less common, because these drugs are not covered by the governmental health insurance and they are costly. One can link these trends to the monthly income, as the majority of patients fall into (less than 2000 NIS) income which truly suggest that income affects medication choices.

There are a very big group of medications that were not mentioned by the patients, because most of them are taking similar drugs as they are being treated in primary care centers by the government. These centers dispense cheap medications, and if the patient's case requires medications not covered by the insurance. The patients tend not to buy it as they are costly, and this is a very big area for research in Palestine. As patients' health status is highly affected by their monthly income.

Urinary incontinence status and the quantity of leaked urine indicate that a substantial portion of patients experience incontinence to varying degrees, emphasizing the importance of addressing this issue in diabetic care.

4.3 Urinary incontinence among diabetic patients in Palestine

Urinary incontinence affects more than 40% of older individuals with diabetes (35). However, there is a lack of research-based evidence regarding how these older adults manage their diabetes and incontinence. The studies imply that having diabetes plus urine incontinence is a complicated experience (36). Evidence suggests that this population might benefit from comprehensive home care that supports self-care (35). When receiving home care services, older persons with type 2 diabetes mellitus frequently have bothersome urinary incontinence (UI). Older persons with UI are more likely to have depression, falls, fractures, and functional deterioration than those without UI (37).

ICIQ scores provide a crucial link between the medication patterns and the impact on urinary incontinence among diabetic patients. Examining these connections shed light on how medication choices might influence the occurrence and severity of UI.

Age alone may not be a direct predictor of UI severity, as there is no significant difference in ICIQ scores among patients of different age groups.

Patients with a primary level of education have higher ICIQ scores, indicating a potential link between education level and UI. However, illiterate patients, despite having the lowest education level, have lower ICIQ scores compared to those with primary education, raising questions about the influence of other unmeasured variables on UI.

Monthly income does not appear to be a primary determinant of urinary incontinence severity among diabetic patients, as there is no significant difference in ICIQ scores between income groups.

Analyzing the relationship between medication types and ICIQ scores is crucial. Patients using Glimepiride and metformin, the most common medications, do not show significantly different ICIQ scores from those using other medication or none at all, suggesting that the choice of medication may not be directly correlated with UI severity. Furthermore, patients using Sitagliptin or Dapagliflozin, which are less commonly prescribed, also do not exhibit substantial variations in ICIQ scores compared to others.

Interestingly, Patients using insulin have slightly lower ICIQ scores than those who do not use insulin, raising questions about the potential protective or mitigating effects of insulin on UI among diabetic patients. However, it is essential to note that this relationship needs more in-depth exploration to establish causation.

Patients experiencing UI have higher ICIQ scores, as expected, indicating that this questionnaire effectively measures the severity of UI. However, the distribution of UI across different medications suggests that medication choice alone may not be the primary factor influencing ICIQ scores. Other variables such as comorbid diseases, lifestyle factors, or individual patients' characteristics might play a more significant role in determining incontinence severity.

According to several clinical studies, bladder hypersensitivity or bladder instability affects between 39 and 61% of individuals with diabetes in both women and men (38). Additionally, a cross-sectional study in India had similar results, as according to the ICIQ-SF, adult patients with T2DM had a moderate prevalence of UI at 15.4% (39).

The literature findings align with the current study patients, as 25.25% of our diabetic patients had urinary incontinence. Although these results are from a small sample in Northern Palestine, they can estimate the disease's actual prevalence.

In addition, the fact that nearly half of the patients experienced urine leakage before reaching the bathroom shows the urgency and discomfort associated with this condition. Moreover, incontinence episodes during activities such as exercise and coughing point to specific triggers that can disrupt the daily routines and potentially limit physical activities. Additionally, the occurrence of incontinence during sleep and after urination suggests potential complications related to bladder function. It is crucial to recognize that incontinence extends beyond a mere inconvenience. It affects the overall quality of life and well-being of diabetic individuals. Healthcare providers should consider these diverse timing patterns when addressing incontinence in diabetic care, aiming to provide comprehensive support and interventions tailored to the specific challenges faced by each patient.

The interaction between diabetes and urinary incontinence is a multifactorial issue that warrants further exploration. Understanding how diabetes contributes to UI or exacerbates it is crucial for developing targeted interventions and treatment plans (40).

It is evident that UI has a significant detrimental impact on the overall quality of life for older adults with diabetes. Healthcare providers need to consider the broader well-being of patients in their management strategies.

In other words, to better understand the experiences and needs of older adults with diabetes and UI, future studies should prioritize the perspectives of patients. This patient-centered approach can provide valuable insights for improving medical care in this population.

While the data does not indicate some variations in ICIQ scores across different factors, establishing direct causation between medication patterns and urinary incontinence severity remains a complex challenge. The interplay of numerous variables requires further research to understand the relationship between medication choice, demographic factors, and the extent of UI among diabetes.

4.3 Burden of urinary incontinence

Although urinary incontinence is not a life-threatening illness, it does create a great deal of discomfort and lowers a person's quality of life (41). Because of this, assessing the urinary system while treating diabetic people for any other condition is crucial. Since the genitourinary organs are multicellular and the pathophysiology and potential processes by which DM patients have higher urologic issues are unclear, it is unlikely that a single mechanism explains voiding failure in diabetes (42). Hence, as the cause of UI is not fully known, research mostly points to processes that are similar to those involved in diabetic microvascular complications (43). The influence of hyperglycemia on different levels of neuron, epithelial, and mesenchymal components makes it crucial to design various treatment classes that may be useful at different stages of diabetes (44).

The ICIQ-UI-SF is a reliable and understandable tool for UI evaluation in clinical practice and research that was used among Saudi women (45). Hence, it was used in the current study to assess UI among Palestinian patients.

The patients in the current study showed varying severities of urinary incontinence according to the ICIQ score. However, the majority of patients had moderate scores. Interestingly, upon linking the diabetes clinical status with ICIQ scores, it was clear that patients with a longer duration of diabetes had worse scores. Additionally, patients with older age had worse scores.

These results are compatible with the literature; for example, Vu 2018 conducted a cross-sectional study to link DM and UI. Elderly diabetic patients were more likely to experience urine incontinence due to advanced age, long-term diabetes, high FPG and HbA1c levels, concomitant conditions, polypharmacy, and cognitive impairment (46).

Additionally, a cross-sectional study in India concluded that having diabetes for a long time and having poor glycemic control may make type 2 diabetic patients more susceptible to UI (39).

Thus, the link between a longer period of diabetes and urinary incontinence was established in several studies (39, 47-49), and the results of the current study did fit within this established literature.

4.4 Satisfaction of patients toward treatment

Urinary incontinence is a common condition among the population. However, its impact on quality of life is still being studied, and there is varied literature from the Arabic region on this issue (50-53). Nonetheless, there are no studies in Palestine regarding this issue.

In Oman, UI is a typical medical condition. However, women were found to be hesitant to seek medical assistance for the disease despite its detrimental effects on QOL (54).

Using ICIQ, 21% of women in Qatar had UI. The quality of life of incontinent women was significantly impacted by social and religious issues (53).

Urinary incontinence can develop in many patients; however, it can be drug-induced (55). Patients with diabetes usually take several medications (polypharmacy) (56). The majority of their antidiabetic drugs do not cause urinary incontinence as a side effect. In fact, according to the literature, α_1 -adrenoceptor antagonists, antipsychotics, benzodiazepines, antidepressants, and hormone replacement treatment for postmenopausal women are among the drug groups that induce urinary incontinence (55). Physicians would be wise to regularly monitor patients for urine incontinence after receiving new prescriptions and/or significant dose adjustments since other medication types are not immune from this risk.

Hence, it is crucial to assess whether the patients link their satisfaction towards diabetic treatment and having urinary incontinence.

One antidiabetic drug group might induce UI (57, 58). In the current study, there were six patients receiving dapagliflozin. Only 1 patient of the 6 reported having urinary incontinence.

4.5 The relationship between urinary incontinence and patient satisfaction with treatment

The current study surveyed the patients for their urinary incontinence status, and then we asked them about their satisfaction with the treatment they were receiving for their diabetes. To achieve our objective, we examined whether urinary incontinence is related to satisfaction with treatment. In other words, does the patient become unsatisfied with their treatment because they have urinary incontinence?

To answer this research question, we conducted a correlation analysis between UI status, severity score and treatment satisfaction. To be more specific, the ICIQ scores were correlated with TSQM scores.

The TSQM score is classified into four domains; each domain was analysed with the ICIQ to check their correlations. As evident from the results section, the ICIQ was not correlated with any domain of the TSQM scores. This means that patient satisfaction with their treatment is not correlated with their UI status. This may be attributed to their understanding that UI is unrelated to the drugs they take to treat their conditions. These results are perfectly in line with the literature, as antidiabetic drugs are mostly not supposed to induce UI.

Examining the sociodemographic distribution of participants in relation to their TSQM-general domain provides valuable insights into how various factors might affect the satisfaction levels of patients with diabetes.

Age does not appear to be a significant determinant of overall satisfaction, as there are no substantial differences in TSQM scores across different age groups. This suggests that age alone may not be a primary factor influencing the general satisfaction of diabetic patients.

Gender also does not play a significant role in determining overall satisfaction levels, as male and female participants exhibit similar TSQM scores. This implies that satisfaction with diabetes management does not differ significantly between genders.

The level of education, on the other hand, seems to have a notable impact on overall satisfaction. illiterate participants have significantly lower TSQM scores compared to those with primary, secondary, or bachelor's education. This suggests that a higher level of education might contribute to greater satisfaction with diabetes management, although other factors may also interfere.

Monthly income does not appear to be a significant determinant of overall satisfaction, also, married and unmarried participants show similar TSQM. This suggests that marital status may not play a role in influencing the satisfaction with diabetes management.

Residential address also does not have an impact on the satisfaction, as there are no differences in TSQM scores among participants of different types of areas (city, village, or Palestinian refugee camp)

Smoking habits, whether being a smoker, non-smoker, or ex-smoker, do not exhibit substantial differences in overall satisfaction levels among the diabetic patients. This indicates that smoking status may not play a primary factor in the general satisfaction of these patients. Also, BMI categories do not exhibit significant variations in overall satisfaction levels among diabetic patients.

The use of herbal supplements also does not influence the overall satisfaction. However, the use of herbal remedies is without a prescription by the physician, this means that the patient decided to take an extra treatment for the condition. Patients decide to add a medication by themselves if they are not satisfied with the current medication. Nonetheless, this was not proven by the current study. This area needs further research in the future to decide why would the patients use herbal remedies despite having the prescribed by their physician.

The number of diabetic drugs taken, surprisingly, does not appear to be significant determinant of overall satisfaction. Patients on different drug regimens show similar TSQM scores, indicating the number of medication taken may not be a primary factor.

Adding to this factor, the number of drugs taken, did not actually influence the satisfaction of patients.

Furthermore, the use of any of the anti-diabetic drugs had no influence on the TSQM, which also means the types of drugs, according to the patients do not interfere with their satisfaction.

This implies that the total number of medications prescribed may not be a primary driver of the general satisfaction with diabetes management. On the other hand, the patient might not link their drug regimens with their UI status. Further research in the future is needed to confirm this result.

Regardless of the number of comorbid conditions, TSQM scores remain relatively consistent, suggesting also that this factor may not be influencing the general satisfaction.

Urinary incontinence status and the quantity leaked, had also no influence on the satisfaction levels towards treatment. As TSQM scores remained consistent across all these groups.

In summary, while various sociodemographic and health related factors have been analyzed in relation to TQM scores, the data suggested that none of these factors individually serve as a dominant determinant of general satisfaction with diabetes management. The interaction of multiple variables and individual patient traits may collectively contribute to overall satisfaction levels among individuals with diabetes. Further research is needed to explore these complex relationships comprehensively.

Nonetheless, the current study aimed to predict whether urinary incontinence status affects treatment satisfaction. Hence, regression analysis was performed between the variables. As a result, the R^2 was considerably low, which shows that the independent variable does not significantly affect the dependent variable's variation. In other words, the variation in the urinary incontinence status of the participants did not affect treatment satisfaction.

The literature confirms these results, as no study confirms that UI status affects satisfaction with treatment. This may be attributed to the fact that we did not ask the diabetic patients about specific treatments, as some other studies did (59, 60). Instead, the patients were asked to complete the TSQM considering the treatment they were taking in general. Future studies need to consider this and ask about urinary

incontinence treatment specifically. Moreover, studies could investigate treatment towards specific new drugs and consider them in the inclusion criteria, such as dapagliflozin and empagliflozin.

4.6 Limitations of the study

The study has certain limitations. The study was conducted in small areas in Palestine, so generalizability is not possible. The patients completed the questionnaire by themselves; hence, recall bias or misinformation is highly suspected. In addition, the design is cross-sectional, which limits the ability to follow up with patients and obtain accurate results.

4.7 Conclusions

The study has provided valuable insights into the relationship between UI and the satisfaction of diabetic patient with their treatment. The findings reveal that UI is a prevalent issue among diabetic patients in Palestine, particularly, among those with longer-lasting diabetes. However, despite the impact of UI on the quality of life of these patients, the study did not find a significant correlation between UI status and treatment satisfaction.

This suggests that diabetes patients generally do not attribute their incontinence to the medication they are taking for their diabetes. While this finding is consistent with existing literature, it limits the importance of addressing UI as a separate concern in diabetic patients management. Furthermore, it highlights the need for comprehensive care strategies that support self-care and consider the broader well being of diabetic patients, particularly as the duration of diabetes increases.

This research enhances our understanding of the challenges faced by diabetic patients with UI in Palestine and emphasizes the importance of comprehensive care. While the study did not find a direct link between urinary incontinence and treatment satisfaction, it provides a foundation for future investigations and confirms the significance of considering the well being of these patients. This study can inform healthcare practices and contribute to improved care for diabetic patients with UI in Palestine and other countries.

Treatment options for these patients will improve with a greater understanding of the various impacting factors.

Because diabetes affects multiple organs to various degrees and each person's glycemic control is different, it is crucial to consider each patient's situation when choosing the best course of action. Common urologic treatments for diabetic patients should be thoroughly reviewed. To provide DM patients with a higher quality of life, it is critical to be aware of these complications to prevent them, detect them early on, and treat them comprehensively.

4.8 Recommendations

Although treatment satisfaction varies from patient to patient, it depends on several aspects. The diabetic patients who had urinary incontinence did not correlate their satisfaction to the condition they felt. However, the hypothesis that a patient who leaks urine is not expected to be satisfied with his treatment was not true, according to the results of the current study. This may be attributed to the fact that patients understand that diabetes is a disease that elevates sugar and do not link the symptom of leaking urine with their diabetes.

It is recommended to improve the awareness of diabetes in patients and educate patients about the complications and symptoms that they could confront. Furthermore, the patients need to clearly comprehend the outcomes they should expect from the drugs they are taking.

List of Abbreviations

Abbreviation	Meaning
BMI	Body Mass Index
DM	Diabetes Mellitus
FPG	Fasting Plasma Glucose
HRQOL	Health-Related Quality Of Life
ICIQ-UI (SF)	International Consultation On Incontinence Questionnaire–Urinary Incontinence Short Form
SD	Standard Deviation
SPSS	Statistical Package For Social Sciences
TSQM	Treatment Satisfaction Questionnaire For Medication
UI	Urinary Incontinence
UTI	Urinary Tract Infection

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Appendices

Appendix A

Study questionnaires (ENGLISH VERSION)

SECTION 1: SOCIODEMOGRAPHIC AND CLINICAL DATA

A. Patient demographic characteristics

A.1 Patient number: _____

A.2 Date of birth: _____

A.3 Age: _____ years

A.4 Gender: ☐ Male ☐ Female

A.5 Weight: _____ kg

A.6 Height: _____ cm

A.7 Level of education: ☐ Illiterate ☐ Primary ☐ Secondary ☐ University
☐ Postgraduate

A.8 Income: ☐ Low (< 2000 NIS) ☐ Moderate (2000-5000 NIS) ☐ High (> 5000 NIS)

A.9 Marital Status: ☐ Married ☐ Single ☐ Divorced ☐ Widowed

A.10 Locality: ☐ Urban ☐ Rural ☐ Camp

A.11 Employment status ☐ Unemployed ☐ Employed ☐ Previously employed before failure onset

A.12 Family history of diabetes mellitus: ☐ Yes ☐ No

B. History and disease comorbidities

B.1 How many years have you suffered from diabetes mellitus? _____

B.2: Smoking ☐ Current smoking ☐ Previous smoker ☐ Nonsmoker

Years of Smoking: _____

B.3. Do you use any herbal remedies: ☐ No ☐ Yes Mention: _____

B.4: Comorbidities:

☐ Hypertension	☐ Ischemic heart disease
☐ Dyslipidemia	☐ Atrial fibrillation
☐ Heart failure	☐ Polycystic kidney disease
☐ Nephrotoxicity	☐ UTI
☐ Systemic infection	☐ Urinary Stones
☐ Anemia	☐ Hyperparathyroidism
	☐ Others:

.....

B.5: Duration of the disease -----

B.6: What medication do you take?

1- ----- 2- ----- 3- ----- 4- -----

SECTION 2: International Consultation on Incontinence Questionnaire Urinary Incontinence Short Form (ICIQ-UI SF).

Many people leak urine at some time. We are trying to determine how many people leak urine and how much this bothers them. We would be grateful if you could answer the following questions, thinking about how you have been, on average, over the PAST FOUR WEEKSS

1 Please write in your date of birth:

DAY		MONTH		YEAR	

2 Are you (tick one):

Female ☐ Male ☐

3 How often do you leak urine? (Tick one box)

never	☐	0
about once a week or less often	☐	1
two or three times a week	☐	2
about once a day	☐	3
several times a day	☐	4
all the time	☐	5

4 We would like to know how much urine you think leaks.

How much urine do you usually leak (whether you wear protection or not)?

(Tick one box)

none	☐	0
a small amount	☐	2
a moderate amount	☐	4
a large amount	☐	6

5 Overall, how much does leaking urine interfere with your everyday life?

Please ring a number between 0 (not at all) and 10 (a great deal)

0	1	2	3	4	5	6	7	8	9	10
not at all										a great deal

ICIQ score: sum scores 3+4+5

6 When does urine leak? (Please tick all that apply to you)

never – urine does not leak	☐
leaks before you can get to the toilet	☐
leaks when you cough or sneeze	☐
leaks when you are asleep	☐
leaks when you are physically active/exercising	☐
leaks when you have finished urinating and are dressed	☐
leaks for no obvious reason	☐
leaks all the time	☐

Thank you very much for answering these questions. Copyright © "ICIQ Group"

SECTION 3: Treatment Satisfaction Questionnaire for Medication (TSQM version II).

TSQM (Version II): Treatment Satisfaction Questionnaire for Medication

Rights to the TSQM v. I and TSQM v. II are shared by Quintiles Strategic Research Services and Pfizer Inc. For permission to use approved formatted versions of the instruments as well as obtaining numerous translations, please contact Shoshana Colman, PhD, Quintiles Strategic Research Services, 475 Brannan Street, Suite 430, San Francisco, CA 94107; Voice: 415.633.3243; Fax: 415.633.3133; shoshana.colman@quintiles.com.

1. How satisfied or dissatisfied are you with the ability of the medication to prevent or treat the condition?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
2. How satisfied or dissatisfied are you with the way the medication relieves symptoms?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
3. As a result of taking this medication, do you experience any side effects at all?
 - ☐1 Yes
 - ☐0 No
4. How dissatisfied are you by side effects that interfere with your physical health and ability to function (e.g., strength, energy levels)?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Somewhat Dissatisfied
 - ☐4 Slightly Dissatisfied
 - ☐5 Not at all Dissatisfied
5. How dissatisfied are you by side effects that interfere with your mental function (e.g., ability to think clearly, stay awake)?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Somewhat Dissatisfied
 - ☐4 Slightly Dissatisfied
 - ☐5 Not at all Dissatisfied
6. How dissatisfied are you by side effects that interfere with your mood or emotions (e.g., anxiety/fear, sadness, irritation/anger)?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Somewhat Dissatisfied
 - ☐4 Slightly Dissatisfied
 - ☐5 Not at all Dissatisfied
7. How satisfied or dissatisfied are you with how easy the medication is to use?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
8. How satisfied or dissatisfied are you with how easy it is to plan when you will use the medication each time?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
9. How satisfied or dissatisfied are you by how often you are expected to use/take the medication?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
10. How satisfied are you that the good things about this medication outweigh the bad things?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied
11. Taking all things into account, how satisfied or dissatisfied are you with this medication?
 - ☐1 Extremely Dissatisfied
 - ☐2 Very Dissatisfied
 - ☐3 Dissatisfied
 - ☐4 Somewhat Satisfied
 - ☐5 Satisfied
 - ☐6 Very Satisfied
 - ☐7 Extremely Satisfied

SCALE SCORING ALGORITHM: TSQM Scale scores range from 0 to 100 and no computed score should be lower or higher than these limits.

EFFECTIVENESS: $\frac{[(\text{Item 1} + \text{Item 2}) - 2]}{(12) \times 100}$

SIDE EFFECTS: $\frac{[(\text{Sum of Item 4 to Item 6}) - 3]}{\text{divided by } (12) \times 100}$

If one item is missing: $\frac{[(\text{Sum of the two completed items}) - 2]}{\text{divided by } (8) \times 100}$

CONVENIENCE: $\frac{[(\text{Sum of Item 7 to Item 9}) - 3]}{\text{divided by } (18) \times 100}$

If one item is missing: $\frac{[(\text{Sum of the two completed items}) - 2]}{\text{divided by } (12) \times 100}$

GLOBAL SATISFACTION: $\frac{[(\text{Sum of Item 10 to Item 11}) - 2]}{\text{divided by } (12) \times 100}$

Appendix B

Arabic version of the questionnaire

عزيزي المشارك، إن الغرض من هذه الاستمارة هو فحص العلاقة بين الرضا عن العلاج وسلس البول لدى مرضى السكري، لذا نرجو منك الإجابة عن الأسئلة التالية، علماً بأن المعلومات التي ستدلي بها ستظل سرية وتستخدم فقط لأغراض البحث العلمي، وشكراً لكم مقدماً.

ملاحظة: الاستمارة مكتوبة في صيغة المذكر إلا أنها موجهة لكلا الجنسين على حد سواء

القسم الأول:

أ. معلومات عامة:

- 1- رقم المريض.....
- 2- تاريخ الولادة.....
- 3- العمر..... سنوات
- 4- الجنس: ☐ ذكر ☐ أنثى
- 5- الطول:
- 6- ما المستوى التعليمي لديك: ☐ غير دارس ☐ ابتدائي ☐ إعدادي ☐ ثانوية عامة ☐ كلية (دبلوم) ☐ جامعي (بكالوريوس) ☐ دراسات عليا
- 7- كم يبلغ معدل الدخل الشهري للعائلة؟
☐ أقل من ٢٠٠٠ شيقل (قليل) ☐ ٢٠٠٠-٥٠٠٠ شيقل (متوسط) ☐ أكثر من ٥٠٠٠ شيقل (عالي)
- 8- الحالة الاجتماعية: ☐ أعزب ☐ متزوج ☐ مطلق ☐ أرمل
- 9- مكان الإقامة: ☐ مخيم ☐ قرية ☐ مدينة ☐ غير موظف
- 10- ما نوع عملك؟ ☐ لا أعمل ☐ موظف ☐ غير موظف
- 11- يوجد احد من عائلتك مع مرض سكري؟ ☐ نعم ☐ لا

ب. التاريخ المرضي:

- 1- كم من الوقت مر على مرض السكري.....
- 2- هل أنت مدخن؟ ☐ نعم ☐ لا ☐ مدخن سابق
- 3- سنوات التدخين:
- 4- هل تستخدم العلاج بالأعشاب: ☐ نعم ☐ لا
- 5- هل لديك أمراض أخرى ☐ سكري ☐ ضغط الدم ☐ التهاب المفاصل ☐ الذئبة الحمراء الجهازية ☐ ذبحة صدرية ☐ جلطة دماغية ☐ قصور في عضلة القلب ☐ مرض رنوي مزمن ☐ غير ذلك، اذكرها.....

6- مدة المرض.....

7- ما هي الأدوية التي تتناولها

- 1-.....
- 2-.....
- 3-.....
- 4-.....
- 5-.....
- 6-.....

غير ذلك.....

القسم الثاني:

1. تاريخ ميلادك؟
2. الجنس ☐ ذكر ☐ أنثى
3. كم مرة تتسرب البول؟
☐ مره واحده في الأسبوع او اقل في كثير من الأحيان ☐ حوالي مره في اليوم
4. ما هو مقدار البول الذي تعتقد انه يتسرب؟ ما هيكمية البول؟
☐ لا يوجد ☐ كمية صغيرة ☐ كمية متوسطة ☐ كمية كبيرة
5. ما مدى تأثير تسرب البول على حياتك اليومية؟ (٠ قليل - ١٠ كثير)
0 1 2 3 4 5 6 7 8 9 10

مجموع ICIQ: جمع ٣+٤+٥

٦ - متى يتسرب البول؟

- ☐ أبداً، البول لا يتسرب
- ☐ يتسرب قبل أن تصل إلى المرحاض
- ☐ يتسرب عند القحه أو العطس
- ☐ يتسرب خلال النوم
- ☐ يتسرب خلال التمرين
- ☐ يتسرب عند الانتهاء من التبول ولبس الملابس
- ☐ التسرب بدون سبب واضح
- ☐ يتسرب كل الوقت

القسم الثالث :

TSQM (نسخة ١,٤)

إستبيان حول الرضا عن المعالجة بالدواء

الإرشادات: نرجو تخصيص بعض الوقت للتفكير بمستوى رضاك أو عدم رضاك عن الدواء الذي تتناوله في هذه التجربة الطبية. يهمننا معرفة تقييمك لفعالية الدواء وأعراضه الجانبية ومدى سهولة إستخدامه على مدى فترة الأسبوعين إلى الثلاثة أسابيع الماضية، أو منذ المرة الأخيرة التي استخدمته فيها. لكل سؤال، الرجاء وضع علامة صح بجانب الإجابة الأكثر تعبيراً عن تجربتك الخاصة مع الدواء.

1. ما مدى رضاك أو عدم رضاك عن قدرة الدواء على الوقاية من حالتك المرضية أو على علاجها؟

- 1 ☐ غير راضٍ إلى أقصى الحدود
- 2 ☐ غير راضٍ جداً
- 3 ☐ غير راضٍ
- 4 ☐ راضٍ إلى حد ما
- 5 ☐ راضٍ
- 6 ☐ راضٍ جداً
- 7 ☐ راضٍ إلى أقصى الحدود

2. ما مدى رضاك أو عدم رضاك عن طريقة تخفيف الدواء للأعراض التي تعاني منها؟

- 1 ☐ غير راضٍ إلى أقصى الحدود
- 2 ☐ غير راضٍ جداً
- 3 ☐ غير راضٍ
- 4 ☐ راضٍ إلى حد ما
- 5 ☐ راضٍ
- 6 ☐ راضٍ جداً
- 7 ☐ راضٍ إلى أقصى الحدود

3. ما مدى رضاك أو عدم رضاك عن الفترة الزمنية التي يستغرقها الدواء ليبدأ مفعوله؟

- 1 ☐ غير راضٍ إلى أقصى الحدود
- 2 ☐ غير راضٍ جداً
- 3 ☐ غير راضٍ
- 4 ☐ راضٍ إلى حد ما
- 5 ☐ راضٍ
- 6 ☐ راضٍ جداً
- 7 ☐ راضٍ إلى أقصى الحدود

4. هل تعاني من أية أعراض جانبية نتيجة لتناولك الدواء؟

- 1 ☐ نعم
- 0 ☐ لا (إن كانت إجابتك لا، فالرجاء الانتقال إلى السؤال رقم ٩)

٥. ما مدى تضاييقك من الأعراض الجانبية للدواء الذي تتناوله لعلاج حالتك؟

- 1 ☐ متضايق لأقصى الحدود
- 2 ☐ متضايق جداً

- 3 ☐ متضايق إلى حد ما
4 ☐ متضايق قليلاً
5 ☐ غير متضايق بناتاً

6. إلى أي درجة تؤثر الأعراض الجانبية على صحتك البدنية وقدراتك الجسدية (أي القوة ومستويات الطاقة... إلخ)؟

- 1 ☐ إلى حد كبير
2 ☐ إلى حد ملحوظ
3 ☐ بعض الشيء
4 ☐ إلى حد ضئيل
5 ☐ أبداً

7. إلى أي درجة تؤثر الأعراض الجانبية على قدرتك العقلية (أي القدرة على التفكير بصفاء والبقاء مستيقظاً... إلخ) ؟

- 1 ☐ إلى حد كبير
2 ☐ إلى حد ملحوظ
3 ☐ بعض الشيء
4 ☐ إلى حد ضئيل
5 ☐ أبداً

8. إلى أية درجة أثرت الأعراض الجانبية للدواء على رضاك العام عنه؟

- 1 ☐ إلى حد كبير
2 ☐ إلى حد ملحوظ
3 ☐ بعض الشيء
4 ☐ إلى حد ضئيل

9- ما مدى سهولة أو صعوبة استخدام الدواء بشكله الحالي؟

- 1 ☐ صعب إلى أقصى الحدود
2 ☐ صعب جداً
3 ☐ صعب
4 ☐ سهل بعض الشيء
5 ☐ سهل
6 ☐ سهل جداً
7 ☐ سهل إلى أقصى الحدود

10. ما مدى سهولة أو صعوبة تنظيم الوقت لاستخدام الدواء في كل مرة؟

- 1 ☐ صعب إلى أقصى الحدود
2 ☐ صعب جداً
3 ☐ صعب
4 ☐ سهل إلى حد ما
5 ☐ سهل
6 ☐ سهل جداً
7 ☐ سهل إلى أقصى الحدود

11. ما مدى مناسبة أو عدم مناسبة تناول الدواء حسب الإرشادات؟

- 1 ☐ غير مناسب بناتاً
2 ☐ غير مناسب جداً
3 ☐ غير مناسب
4 ☐ مناسب إلى حد ما
5 ☐ مناسب
6 ☐ مناسب جداً
7 ☐ مناسب إلى أقصى الحدود

12. بشكل عام، إلى أي حد أنت واثق من أن تناول هذا الدواء مفيدٌ لك؟

- 1 ☐ غير متأكد بناتاً
2 ☐ متأكد قليلاً

- 3 ☐ متأكد إلى حد ما
4 ☐ متأكد جداً
5 ☐ متأكد إلى أقصى الحدود

13. إلى أي حد أنت متأكد من أن إيجابيات الدواء الذي تتناوله تفوق سلبياته؟

- 1 ☐ غير متأكد بتاتاً
2 ☐ متأكد قليلاً
3 ☐ متأكد إلى حد ما
4 ☐ متأكد جداً
5 ☐ متأكد إلى أقصى الحدود

14. إذا أخذنا جميع الأمور بعين الاعتبار، ما مدى رضاك أو عدم رضاك عن هذا الدواء؟

- 1 ☐ غير راضٍ إلى أقصى الحدود
2 ☐ غير راضٍ جداً
3 ☐ غير راضٍ
4 ☐ راضٍ إلى حد ما
5 ☐ راضٍ
6 ☐ راضٍ جداً
7 ☐ راضٍ إلى أقصى الحدود

Appendix C

IRB approval

An-Najah National University
Faculty of Medicine & Health
Sciences
Institutional Review Board



جامعة النجاح الوطنية
كلية الطب وعلوم الصحة
لجنة أخلاقيات البحث العلمي

Re: Mas. May. 2022/1

IRB Approval Letter

Title of Research:

Association between treatment satisfaction and urinary incontinence among diabetic patients: a cross-sectional study from Palestine

Submitted by :
Shaharзад Byadseh

Supervisor:
Sae'd Zyoud, Samah Al-Jabi³

Approved:
8th May. 2022

Your Study Title “**Association between treatment satisfaction and urinary incontinence among diabetic patients: a cross-sectional study from Palestine.**” reviewed by An-Najah National University IRB committee and was approved on 8th May. 2022


Hasan Fitian, MD
IRB Committee Chairman



Appendix D

TSQM 1.4 questionnaire results

Questions	Frequency	Percent
1. How satisfied are you with the ability of the medication to prevent or treat your condition?		
Extremely Dissatisfied	2	0.5
Very Dissatisfied	15	3.8
Dissatisfied	17	4.3
Somewhat Satisfied	44	11.0
Satisfied	129	32.3
Very Satisfied	173	43.3
Extremely Satisfied	20	5.0
2. How satisfied are you with the way the medication relieves symptoms?		
Extremely Dissatisfied	2	0.5
Very Dissatisfied	17	4.3
Dissatisfied	23	5.8
Somewhat Satisfied	58	14.5
Satisfied	135	33.8
Very Satisfied	135	33.8
Extremely Satisfied	28	7.0
Total	398	99.5
System	2	0.5
3. How satisfied are you with the time the medication needs to treat your condition?		
Extremely Dissatisfied	6	1.5
Very Dissatisfied	18	4.5
Dissatisfied	35	8.8
Somewhat Satisfied	124	30.8
Satisfied	97	24.3
Very Satisfied	103	25.8
Extremely Satisfied	17	4.3
4. Do you have side effects? (if No go to question 9)		
No	365	91.3
Yes	35	8.8
5. How dissatisfied are you by the side effects the medication makes?		
No side effects	365	90.8
Extremely Bothersome	8	2.0
Very Bothersome	6	1.5
Somewhat Bothersome	8	2.0
A Little Bothersome	11	2.8

Questions	Frequency	Percent
Not at All Bothersome	2	0.5
Total	398	99.5
6. How dissatisfied are you by the side effects that interfere with you physical health and ability to function (strength, energy level, ..)?		
No side effects	365	90.8
A Great Deal	14	3.5
Quite a Bit	16	4.0
Somewhat	3	0.8
Minimally	1	0.3
Not at All	1	0.3
7. How dissatisfied are you by the side effects that interfere with you mental health (inability to stay awake, concentrate,...)		
No side effects	365	90.8
A Great Deal	10	2.5
Quite a Bit	4	1.0
Somewhat	7	1.8
Minimally	6	1.5
Not at All	8	2.0
8. To what degree did the side effect affected you satisfaction of the medication?		
No side effects	365	90.8
A Great Deal	5	1.3
Quite a Bit	6	1.5
Somewhat	18	4.5
Minimally	6	1.5
9. How easy or difficult is the medication to use?		
Very Difficult	19	4.8
Difficult	10	2.5
Somewhat Easy	40	10.0
Easy	130	32.5
Very Easy	172	43.0
Extremely Easy	29	7.3
10. How easy or difficult it is to plan when you will use the medication each time?		
Very Difficult	17	4.3
Difficult	17	4.3
Somewhat Easy	46	11.5
Easy	116	29.0
Very Easy	154	38.5
Extremely Easy	49	12.3
Total	399	99.8

Questions	Frequency	Percent
System	1	0.3
11. How satisfied are you with how easy/suitable it is to use/take the medication each time as instructions?		
Extremely Inconvenient	1	0.3
Very Inconvenient	20	5.0
Inconvenient	20	5.0
Somewhat Convenient	128	31.5
Convenient	123	30.3
Very Convenient	91	22.8
Extremely Convenient	17	4.3
12. Are you certain the medication is good for you?		
Not at All Confident	20	5.0
A Little Confident	19	4.8
Somewhat Confident	75	18.8
Very Confident	273	68.3
Extremely Confident	13	3.3
13. How much sure are you that the good things about this medication outweigh the bad things?		
Not at All Certain	11	2.8
A Little Certain	22	5.5
Somewhat Certain	79	19.8
Very Certain	264	66.0
Extremely Certain	24	6.0
14. Taking all things into account, how satisfied or dissatisfied are you with this medication?		
Extremely Dissatisfied	7	1.8
Very Dissatisfied	8	2.0
Dissatisfied	12	3.0
Somewhat Satisfied	36	9.0
Satisfied	184	45.8
Very Satisfied	129	32.0
Extremely Satisfied	24	6.0

Appendix E

Tables of Study

Table E-1

The timing of leaking urine

When does it leak?	Frequency	Percentage
Before Bathroom	90	89.11%
When coughing	64	63.37%
After urination	2	1.98%
During exercise	34	33.66%
During sleep	13	12.87%
With no obvious underlying reason	2	1.98%
Leaks all the time	0	0.00%

Table E-2

TSQM domains

TSQM domains	Minimum	Maximum	Mean	Std. Deviation
Domain Effectiveness	5.6	100.0	66.125	16.6532
Domain Side Effects	6.3	100.0	94.687	17.9661
Domain Convenience	11.1	100.0	68.111	14.5770
Domain Global satisfaction	.0	100.0	67.179	16.4662

Table E-3*Sociodemographic distribution of participants among the ICIQ score*

Item	Variable	Freq. N=400	(%)	Mean	±SD	Median	[IQR]	Mean Rank	P value	Freq. N=101	Mean Rank	P value
Age Groups	Less than 45 years	61	(15.25)	9.85	±3.28	10.0	[8-12]	200.23	0.962 ^a	16	42.50	*,011 ^a
	45-55 years	69	(17.25)	9.25	±3.94	9.0	[6.5-11]	195.49		16	47.19	
	56-65 years	138	(34.5)	10.34	±4.57	10.0	[7-14]	201.57		35	54.33	
	More than 65 years	132	(33)	9.72	±3.51	10.0	[7-12]	202.13		34	53.37	
Gender	Male	190	(47.5)	10.19	±3.4	10.0	[8-12]	201.01	0.913 ^b	48	52.91	*,032 ^b
	Female	210	(52.5)	9.64	±4.39	9.0	[6-12]	200.04		53	49.27	
Level of Education	Illiterate	16	(4)	10.71	±1.25	11.0	[10-11]	242.47	0.000 ^a	7	62.36	*,097 ^a
	Primary	83	(20.75)	9.93	±4.55	9.0	[7-12]	226.06		32	48.28	
	Secondary	216	(54)	10.36	±3.77	10.0	[8-13]	199.94		53	54.53	
	Bachelor	85	(21.25)	6.25	±2.71	6.0	[4-8.5]	169.06		9	31.06	
Monthly income	Less than 2000 NIS	183	(45.75)	10.24	±3.98	10.0	[8-12]	190.29	0.112 ^a	39	40.79	*,014 ^a
	2000-5000 NIS	181	(45.25)	8.54	±3.8	7.0	[6-10.5]	205.02		50	54.72	
	More than 5000 NIS	34	(8.5)	11.36	±3.35	12.0	[10.5-14]	218.81		11	65.73	
Marital Status	Married	280	(70)	10.01	±3.86	10.0	[7-12]	199	0.603 ^b	68	52.75	*,387 ^b
	Unmarried	120	(30)	9.56	±4.3	10.0	[6-13]	204.01		33	47.39	
Address	City	239	(59.75)	10.35	±4.3	10.0	[7-13.5]	194	0.075 ^a	53	54.94	*,183 ^a
	Village	137	(34.25)	9.45	±3.51	10.0	[7-11]	211.45		44	46.43	
	Palestinian Refugee Camp	21	(5.25)	7.33	±2.08	8.0	[6.5-8.5]	174.67		3	31.67	
Smoking	Smoker	132	(33)	10.17	±4.06	10.0	[7-13.5]	207.99	0.410 ^a	38	52.43	*,806 ^a
	Nonsmoker	215	(53.75)	9.69	±4.18	9.0	[7-12]	195.20		49	49.34	
	Ex-smoker	53	(13.25)	9.78	±3.23	10.0	[8-12]	203.34		14	52.93	
Herbals	Yes	36	(9)	8.25	±3.28	7.5	[6-9.5]	198.03	0.860 ^b	9	43.11	*,396 ^b
	No	364	(91)	10.04	±4.01	10.0	[7-12]	200.74		92	51.77	
BMI category	Underweight	8	(2)					217.94	0.116 ^a	3	32.17	*,617 ^a
	Normal Weight	70	(17.5)	9.40	±4.88	8.5	[5-15]	180.7		11	46.36	
	Overweight	129	(32.25)	10.11	±3.94	10.0	[7-12]	197.13		30	53.67	

	Obese	193	(48.25)	9.86	±3.91	10.0	[7-11]	209.21		57	51.48	
Number of Diabetic Drugs	Monotherapy	232	(58)	10.07	±4.02	10.0	[7-12]	182.89	0.515 ^b	55	47.14	*, 98.0 ^b
	Combination Therapy	137	(34.25)	9.61	±3.92	10.0	[7-12]	188.57		37	45.55	
Total Number of Comorbid Diseases	0	136	(34)	9.95	±3.65	11.0	[7-12]	191.03	0.077 ^a	28	50.29	*, 92.9 ^a
	1	175	(43.75)	10.25	±4.1	10.0	[7-12]	198.52		42	53.15	
	2	74	(18.5)	9.45	±3.58	9.0	[7-14]	212.10		23	50.80	
	3	12	(3)	9.33	±6.4	9.0	[4-10]	245.88		6	42.75	
	4	3	(0.75)	8.50	±2.12	8.5	[7-10]	277.83		2	42.75	
Total Number of Drugs	1-3 drugs	226	(56.5)	10.50	±4.03	11	[7-13]	181.57	0.332 ^b	51	50.66	0.051 ^a
	4-6 drugs	117	(29.3)	8.53	±3.46	8	[6-11]	186.97		32	37.41	
	7 drugs or more	26	(6.5)	11.44	±4.12	10	[10-11]	205.9		9	55.28	
Insulin	No	180	(45)	10.02	±4.13	11.0	[6.5-12]	183.33	0.70 ^b	43	47.58	*, 91.0 ^b
	Yes	189	(47.25)	9.77	±3.86	9.5	[7-12]	186.59		49	45.55	
Glimepiride	No	286	(71.5)	10.01	±4.09	9.0	[7-12]	184.18	0.717 ^b	70	46.58	*, 96.0 ^b
	Yes	83	(20.75)	9.50	±3.6	11.0	[6-12]	187.84		22	46.25	
metformin	No	151	(37.75)	9.70	±3.46	9.0	[7-12]	190.02	0.322 ^b	42	45.43	*, 92.3 ^b
	Yes	218	(54.5)	10.04	±4.37	10.0	[7-13]	181.52		50	47.40	
Sitagliptin	No	352	(88)	9.85	±4.05	10.0	[7-12]	182.39	0.005 ^b	83	46.02	*, 60.2 ^b
	Yes	17	(4.25)	10.25	±3.19	10.0	[8.5-11]	239.00		9	50.89	
Dapagliflozin	No	358	(89.5)	9.8161	±3.86	10.0	[7-12]	184.33	0.364 ^b	88	46.41	*, 87.8 ^b
	Yes	11	(2.75)	11.50	±6.35	8.5	[8-15]	206.82		4	48.50	
Urinary Incontinence status	Never	299	(74.75)	10.05	±3.65	10.0	[7-12]	150.0	0.000 ^a	75	52.70	*, 94.8 ^a
	About once a week	52	(13)	9.33	±4.89	9.0	[7-11]	336.39		11	43.91	
	Two to three times a week	18	(4.5)	9.16	±3.86	10.5	[5-12]	372.42		6	49.33	
	Once a day	23	(5.75)	8.50	±5	8.0	[5-10]	352.67		6	40.42	
	Several times a day	2	(0.5)					381.50				
	All the time	6	(1.5)	12.00	±7.54	11.0	[8-15.5]	379.92		3	59.00	
Quantity of leaked	None	300	(75)	10.05	±3.62	10.0	[7-12]	150.62	0.000 ^a	76	52.74	*, 94.9 ^a

urine	a small amount	56	(14)	9.25	±5.2	9.0	[5.5-11.5]	337.19		12	45.33	
	a moderate amount	32	(8)	11.62	±3.85	11.5	[10.5-12.5]	360.86		9	60.22	
	a large amount	12	(3)	4.00	±1	4.0	[3.5-4.5]	381.92		4	14.25	
	<5 years	98	(24.5)	10.16	±4.31	10.0	[6-12]	197.14	0.793 ^a	23	51.85	0.793 ^a
	5-10 years	93	(23.25)	9.33	±3.28	9.0	[7-11]	194.61		21	48.57	
	10-20 years	124	(31)	10.58	±3.87	10.0	[8-13]	204.33		33	55.15	
	>20 years	85	(21.25)	9.20	±4.34	9.5	[5.5-11]	205.23		24	46.60	

^a Statistical significance of differences calculated using the Kruskal–Wallis test.

^b Statistical significance of differences calculated using the Mann–Whitney U test.

ICIQ: International Consultation on Incontinence Questionnaire, IQR: Interquartile range, SD: Standard Deviation, Freq.: Frequency, DM: Diabetes Mellitus, BMI: Body Mass Index

Table E-4*Sociodemographic distribution of participants among the total satisfaction score (TSQM-General Domain)*

	Variable	Freq. N=400	(%)	Mean	±SD	Median	[IQR]	Mean Rank	P value
Age Groups	Less than 45 years	61	(15.25)	65.207	±17.56	71.43	[64.28-71.42]	200.36	0.892 ^a
	45-55 years	69	(17.25)	64.706	±20.19	71.43	[64.28-78.57]	192.80	
	56-65 years	138	(34.5)	68.144	±15.47	71.43	[64.28-78.57]	205.57	
	More than 65 years	132	(33)	66.978	±16.52	71.43	[64.28-78.57]	199.30	
Sex	Male	190	(47.5)	66.188	±17.36	71.43	[64.28-78.57]	196.58	0.007 ^b
	Female	210	(52.5)	67.404	±16.63	71.43	[64.28-78.57]	204.05	
Level of Education	Illiterate	16	(4)	58.482	±22.46	64.29	[53.57-71.42]	139.44	0.000 ^a
	Primary	83	(20.75)	64.935	±17.15	71.43	[64.28-71.42]	188.37	
	Secondary	216	(54)	68.294	±17.19	71.43	[64.28-78.57]	211.88	
	Bachelor	85	(21.25)	66.790	±14.32	71.43	[64.28-78.57]	194.91	
Monthly income	Less than 2000 NIS	183	(45.75)	68.571	±16.26	71.43	[71.42-78.57]	202.36	0.299 ^a
	2000-5000 NIS	181	(45.25)	67.766	±14.17	71.43	[64.28-75]	198.00	
	More than 5000 NIS	34	(8.5)	64.935	±22.46	71.43	[64.28-71.42]	192.13	
Marital Status	Married	280	(70)	67.001	±16.84	71.43	[64.28-78.57]	198.78	0.601 ^b
	Unmarried	120	(30)	66.391	±17.36	71.43	[64.28-75]	204.50	
Address	City	239	(59.75)	66.079	±18.15	71.43	[64.28-78.57]	198.39	0.679 ^a
	Village	137	(34.25)	68.005	±14.13	71.43	[64.28-71.42]	196.90	
	Palestinian Refugee Camp	21	(5.25)	68.651	±18.99	71.43	[71.42-78.57]	219.64	
Smoking	Smoker	132	(33)	64.571	±18.66	71.43	[64.28-71.42]	184.30	0.000 ^a

	Nonsmoker	215	(53.75)	68.313	±15.65	71.43	[64.28-78.57]	211.03	
	Ex-smoker	53	(13.25)	66.981	±16.93	71.43	[64.28-78.57]	198.12	
Herbals	Yes	36	(9)	67.411	±13.44	67.86	[64.28-71.42]	191.89	0.130 ^b
	No	364	(91)	66.788	±17.27	71.43	[64.28-78.57]	201.35	
BMI category	Underweight	8	(2)	73.810	±7.37	71.43	[71.42-78.57]	205.56	0.139 ^a
	Normal Weight	70	(17.5)	66.454	±16.22	71.43	[64.28-78.57]	205.04	
	Overweight	129	(32.25)	67.381	±18.97	71.43	[64.28-78.57]	208.86	
	Obese	193	(48.25)	66.382	±16.03	71.43	[64.28-71.42]	193.06	
Number of Diabetic Drugs	Monotherapy	232	(58)	65.646	±17.65	71.43	[64.28-78.57]	179.55	0.190 ^b
	Combination Therapy	137	(34.25)	68.889	±15.54	71.43	[64.28-78.57]	194.23	
Total Number of Comorbid Diseases	0	136	(34)	66.579	±18.18	71.43	[64.28-78.57]	206.05	0.138 ^a
	1	175	(43.75)	68.151	±15.04	71.43	[64.28-78.57]	205.36	
	2	74	(18.5)	63.690	±19.54	71.43	[64.28-71.42]	178.96	
	3	12	(3)	67.857	±15.07	64.29	[57.14-78.57]	190.71	
	4	3	(0.75)	73.810	±10.91	71.43	[67.85-78.57]	236.17	
Total Number of drugs	1-3 drugs	226	56.5	66.9	17.19	71.43	[64.28-78.57]	186.70	0.689 ^a
	4-6 drugs	117	29.3	66.66	17.82	71.43	[64.28-78.57]	185.35	
	7 drugs or more	26	6.5	68.13	8.62	64.29	[64.28-78.57]	168.21	
Insulin	No	180	(45)	66.002	±17.03	71.43	[64.28-78.57]	176.89	0.143 ^b
	Yes	189	(47.25)	67.647	±16.89	71.43	[64.28-78.57]	192.72	
Glimepiride	No	286	(71.5)	66.147	±17.79	71.43	[64.28-78.57]	183.41	0.086 ^b
	Yes	83	(20.75)	69.251	±13.5	71.43	[64.28-71.42]	190.46	
Metformin	No	151	(37.75)	67.258	±16.56	71.43	[64.28-78.57]	188.91	0.048 ^b
	Yes	218	(54.5)	66.557	±17.25	71.43	[64.28-78.57]	182.29	

Sitagliptin	No	352	(88)	66.531	±17.07	71.43	[64.28-78.57]	183.59	0.230 ^b
	Yes	17	(4.25)	73.661	±12.7	71.43	[64.28-78.57]	214.21	
Dapagliflozin	No	358	(89.5)	66.821	±16.97	71.43	[64.28-78.57]	184.68	0.739 ^b
	Yes	11	(2.75)	67.532	±17.3	71.43	[64.28-78.57]	195.27	
Urinary Incontinence Status	Never	299	(74.75)	67.047	±16.41	71.43	[64.28-78.57]	201.40	0.292 ^a
	About once a week	52	(13)	69.000	±16.92	71.43	[64.28-78.57]	217.47	
	Two to three times a week	18	(4.5)	60.924	±23.43	64.29	[57.14-71.42]	159.22	
	Once a day	23	(5.75)	67.532	±12.21	71.43	[64.28-78.57]	196.91	
	Several times a day	2	(0.5)					111.50	
	All the time	6	(1.5)	54.762	±31.83	71.43	[14.28-71.42]	175.83	
Quantity of leaked urine	None	300	(75)	67.037	±16.38	71.43	[64.28-78.57]	201.10	0.276 ^a
	a small amount	56	(14)	67.532	±18.07	71.43	[64.28-78.57]	211.14	
	a moderate amount	32	(8)	63.134	±18.63	64.29	[57.14-75]	167.22	
	a large amount	12	(3)	69.286	±21.57	71.43	[64.28-85.71]	224.58	
Duration of DM	<5 years	98	(24.5)	66.138	±15.72	71.43	[64.28-71.42]	197.86	0.238 ^a
	5-10 years	93	(23.25)	64.118	±19.77	71.43	[64.28-78.57]	182.05	
	10-20 years	124	(31)	68.658	±15.92	71.43	[64.28-78.57]	212.77	
	>20 years	85	(21.25)	67.772	±16.31	71.43	[64.28-78.57]	205.83	

^a Statistical significance of differences calculated using the Kruskal–Wallis test.

^b Statistical significance of differences calculated using the Mann–Whitney U test.

ICIQ: International Consultation on Incontinence Questionnaire, IQR: Interquartile range, SD: Standard Deviation, Freq.: Frequency, DM: Diabetes Mellitus, BMI: Body Mass Index



جامعة النجاح الوطنية

كلية الدراسات العليا

العلاقة بين الرضا عن العلاج وسلس البول لدى مرضى

السكري: دراسة مقطعية من فلسطين

إعداد

شهرزاد بيادسة

إشراف

أ. د. سائد الزيود

د. سماح الجابي

قدمت هذه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير في الصيدلة السريرية، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس - فلسطين.

٢٠٢٣

العلاقة بين الرضا عن العلاج وسلس البول لدى مرضى السكري:

دراسة مقطعية من فلسطين

إعداد

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إشراف

أ. د. سائد الزيود

د. سماح الجابي

الملخص

المقدمة: داء السكري من النوع ٢ هو اضطراب أيضي مزمن. يمكن أن تضر هذه الأمراض وتتسبب في تعقيدات في الحياة اليومية مرتبطة بالوفيات والاضطرابات الأخرى. لذلك، فإن هذا المرض يؤثر بشكل كبير على الروتين اليومي في الحياة ويؤثر على جودة الصحة. علاوة على ذلك، فإن الرضا عن علاج المرضى وروتينهم هو جانب مهم. وبالتالي، هناك حاجة إلى البحث للعثور على مزيد من هذه الارتباطات بين الرضا عن العلاج وما يعانيه المريض.

الأهداف: تبحث هذه الدراسة في العلاقة بين الرضا عن العلاج ومجالاته مع سلس البول لدى مرضى السكري. بالإضافة إلى ذلك، فحص حالة سلس البول كمتغير للتحقق من القدرة على التنبؤ بالرضا عن العلاج.

المنهجية: تم تصميم دراسة مقطعية لاستبيان مرضى السكري من مراكز الرعاية الأولية في فلسطين بين الأول من حزيران (يونيو) ٢٠٢٢ والأول من تشرين الأول (أكتوبر) ٢٠٢٢. تم مسح أربع مائة مريض بالسكري لملء الاستبيان المكون من أسئلة اجتماعية وديموغرافية، استبيان سلس البول (ICIQ-UI-SF)،

واستبيان الرضا عن العلاج (TSQM 1.4). تم تحليل النتائج للعثور على الإحصاء الوصفي والارتباطات والانحدارات بين الرضى عن علاج وسلس البول. تم التحليل باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS).

النتائج: شملت الدراسة ٤٠٠ مريض بالسكري من مراكز الصحة الأولية في شمال الضفة الغربية. تراوحت أعمار المرضى بين ١٨ و ٨٩ سنة، منهم ٢١٠ ذكور و ١٩٠ إناث. طُلب من المرضى الإجابة على ICIQ-UI-SF، وأظهرت النتائج أن ١٠١ من أصل ٤٠٠ مريض سكري يعانون من سلس البول. شدة سلس البول لدى هؤلاء المرضى تراوحت بين عدة درجات، خفيفة (١٥٪)، معتدلة (٦٥٪)، شديدة (١٨٪) وشديدة جداً (٣٪). بالإضافة إلى ذلك، طُلب من المرضى ملء TSQM (١,٤) لاستكشاف مدى رضاهم عن العلاج. كشف تحليل الاستبيان عن أربعة مجالات للرضى، فكلما زادت الدرجة زاد الرضا. على سبيل المثال، مجال الرضى عن الفعالية (٦٦,١٢٥ ± ١٦,٦)، مجال الرضى عن الآثار الجانبية (٩٤,٦٨ ± ١٧,٩)، مجال الرضا عن ملاءمة العلاج (٦٨,١١ ± ١٤,٥٧)، مجال الرضا بشكل عام (٦٧,١٧ ± ١٦,٤٦). لم يكن تحليل الارتباط بين الرضا عن العلاج وسلس البول ذو معنى احصائي. مما يعني أن المرضى لم يربطوا بين حالة سلس البول ورضاهم اتجاه العلاج. أيضاً أظهر تحليل الانحدار أن الرضى تجاه العلاج لا يمكن التنبؤ به من حالة سلس البول.

الخلاصة: أظهرت نتائج الدراسة أن رضا مرضى السكري عن علاجهم لا علاقة له بوضعهم البولي. ومع ذلك، يجب إجراء المزيد من الدراسات ذات تصميم تدخل لاستكشاف العلاقات بشكل أكبر.

الكلمات المفتاحية: مرض السكري؛ رضى؛ سلس البول؛ علاج؛ فلسطين؛ TSQM؛ ICIQ؛ استبيان.