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DOI: 10.5742/MEWFM.2025.952578549



## Editorial

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In this issue multiple papers address diverse health challenges through multidisciplinary approaches in primary care. The recent submissions to our journal highlight the essential role of primary care in addressing a wide spectrum of health conditions, each presenting unique challenges and requiring tailored approaches. From testicular lumps to depression in diabetic patients, to COPD management and physician attire preferences, the diversity of these topics underscores the complexity and breadth of primary care responsibilities.

Dr. Taha Alver Ansari's work on the management of testicular lumps in primary care is particularly noteworthy. It emphasizes the crucial role of early detection and accurate diagnosis in managing potentially malignant conditions, such as testicular cancer, alongside more benign causes of scrotal swellings. This research not only aids in clinical guidance but also underscores the importance of patient education and the need for vigilance in primary settings.

Parallel to this, the study led by Dr. Huda Youssef Al-Ghareeb on the prevalence of undiagnosed depression among Type 2 diabetic patients in Kuwait sheds light on the psychological burdens often accompanying chronic illnesses. This research highlights the interplay between mental and physical health, advocating for an integrated approach in managing diabetes that includes mental health as a component of comprehensive care.

Furthermore, the investigation into COPD management at a tertiary care hospital in Nepal, spearheaded by Dr. Sushil Kharel, offers insights into the complexities of managing chronic respiratory diseases. The findings regarding

drug utilization patterns provide critical data that could influence treatment protocols and patient outcomes, reflecting the necessity of multi-drug strategies in chronic disease management.

Lastly, the study on patients' preferences for physicians' attire in Qatar, conducted by Dr. Sara Humaida and colleagues, explores an often-overlooked aspect of medical practice: the impact of physician presentation on patient comfort and trust. This research is a reminder of the cultural dimensions of healthcare and the need for cultural competence among healthcare providers.

Collectively, these studies demonstrate the multi-dimensional challenges faced in primary care and the importance of a multidisciplinary approach in healthcare. Each piece of research contributes to a holistic understanding of patient care, emphasizing that the management of health extends beyond mere physical ailments to encompass psychological, cultural, and educational dimensions. The commitment to addressing these diverse aspects of health care is what ultimately will lead to improved patient outcomes and satisfaction. This editorial hopes to inspire continued research and discussion on these critical topics within the primary care community.



### Notice: 7th Annual Saudi International Vaccination Forum

We are pleased to announce the 7th Annual Saudi International Vaccination Forum, a premier event dedicated to advancing vaccination efforts in the Middle East. This highly anticipated forum will bring together policymakers, esteemed regional and international experts, and professional associations to exchange insights, discuss the latest developments, and explore both national and international guidelines in the field of vaccination.

The forum will feature an exceptional scientific program, including sessions on:

- Vaccine policy and regulations
- Latest updates on vaccines and vaccine-preventable diseases
- New vaccines in the pipeline
- Strategies to combat vaccine hesitancy
- And much more, through engaging presentations, panel discussions, and the Saudi Vaccination Award.

This year's theme, "Vaccination for Healthier Communities: Protecting Lives, Promoting Wellbeing," highlights the transformative power of vaccination in creating healthier, more resilient communities. It underscores the importance of protecting lives, preventing diseases, and promoting overall wellbeing.

The forum aims to strengthen partnerships and inspire a collective commitment to achieving a healthier and safer future for all.

We invite you to be part of this pivotal event that is shaping the future of vaccination in the region!

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Date: 16-18 May 2025

Location: Crowne Plaza Hotel, Riyadh, KSA

For more information and registration, please visit: <https://saudivaccinationforum.com/>

# Management of scrotal swellings in primary care

Taha Alver Ansari

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Received: February 2025. Accepted: February 2025; Published: April 1, 2025.

Citation: Taha Alver Ansari. Management of scrotal swellings in primary care. World Family Medicine. April 2025; 23(2): 6-9

DOI: 10.5742/MEWFM.2025.95257852

## Abstract

Testicular lumps are a common presenting concern in primary care. While many of these lumps are benign, such as hydroceles or epididymal cysts, they can also indicate more serious conditions like testicular cancer. Early and accurate identification of the nature of testicular lumps is crucial to ensure appropriate management and optimal outcomes. This report provides a comprehensive overview of the management of testicular lumps in primary care, covering epidemiology, clinical presentation, differential diagnosis, diagnostic approach, management strategies, and patient education.

**Keywords:** Testicular lumps, epidemiology, clinical presentation, differential diagnosis, diagnostic approach, management strategies, patient education

## Clinical Case

A 28-year-old male presented to his General Practitioner during winter with the sudden onset of left-sided scrotal pain. He described being awakened three hours prior by sharp left lower quadrant pain, which soon radiated to the scrotum, accompanied by swelling. The patient denied experiencing fever, chills, vomiting, or trauma, though he reported associated nausea.

On examination, his abdomen appeared normal, but there was noticeable enlargement of the left scrotum. Palpation revealed tenderness, mild erythema, and enlargement of the left testicle, along with a thickened spermatic cord. Elevation of the scrotum did not provide relief, and the affected testicle was positioned slightly higher than the unaffected one.

Urinalysis performed in the clinic showed 2+ leucocytes, with no other significant findings. He was subsequently referred to the on-call urologist and sent to the emergency department for an urgent surgical consultation, including exploration and de-torsion, to preserve testicular function.

## Epidemiology

Testicular lumps can affect males of all ages, but the incidence and etiology can vary significantly based on age groups. Testicular cancer, for instance, is most common in younger men aged 15-35 years, with a median age of 32 at diagnosis {13}. Benign conditions like epididymal cysts are more prevalent in middle-aged and older men. The lifetime risk of testicular cancer is about 1 in 250, but it accounts for only about 1% of all cancers in men {10}, highlighting the rarity but significant concern of malignant lumps.

## Clinical Presentation

### Symptoms

Patients with testicular lumps may present with various symptoms including:

- A palpable lump or swelling in the testicle.
- A sensation of heaviness or aching in the scrotum.
- Pain or discomfort in the testicle or scrotum, which may radiate to the groin.
- Sudden onset of scrotal pain, which can indicate torsion or acute inflammation. The most common cause of scrotal pain is epididymitis {1}, the majority presenting at age 20 to 39 years.
- Associated systemic symptoms like fever if infection is present.

### History

A thorough history is crucial in the initial evaluation of a patient presenting with a testicular lump. Important aspects to cover include:

- Onset and duration of the lump.
- Presence of pain or discomfort.
- Any associated symptoms such as urinary difficulties, fever, or weight loss.
- Sexual history and risk of sexually transmitted infections.
- Personal or family history of testicular cancer or other cancers.
- History of trauma to the area.

### Differential Diagnosis

The differential diagnosis of a testicular lump is broad, including both benign and malignant conditions. Some of the key conditions to consider are:

#### Benign Conditions

**Hydrocele:** Accumulation of fluid around the testicle, usually presenting as a painless, smooth, and transilluminable swelling.

**Epididymal Cyst:** Fluid-filled cyst arising from the epididymis, often asymptomatic and discovered incidentally.

**Varicocele:** Dilatation of the pampiniform plexus veins within the scrotum, typically presenting as a "bag of worms" on palpation and more noticeable when standing.

It is thought that 10-15% of men and adolescent boys have a varicocele in the general population {2}.

**Epididymitis/Orchitis:** Inflammation of the epididymis or testicle, often due to infection, presenting with pain, swelling, and sometimes fever.

**Spermatocele:** A cystic accumulation of sperm, usually painless and located above and behind the testicle.

**Testicular Torsion:** A surgical emergency where the spermatic cord twists, cutting off blood supply to the testicle, presenting with sudden, severe pain and swelling.

#### Malignant Conditions

**Testicular Cancer:** Presents as a painless, firm lump in the testicle. Types include seminomas and non-seminomas (e.g., embryonal carcinoma, teratoma, choriocarcinoma).

- It is useful to note that up to 20% of men present with painful swelling of sudden onset due to hemorrhage or infection {5}.

**Lymphoma:** Rare in the testicle but can present as a painless mass, more common in older men.

## Diagnostic Approach

### Physical Examination

A thorough physical examination is essential. Key components include:

**Inspection:** Look for asymmetry, swelling, skin changes, or signs of trauma.

**Palpation:** Systematic palpation of each testicle and epididymis. A normal testicle is smooth, firm, and slightly sensitive. Note the size, shape, consistency, and mobility of any lumps.

**Transillumination:** Helps differentiate cystic (transilluminable) from solid masses.

**Abdominal and inguinal examination:** To check for lymphadenopathy or masses.

A male scrotal exam is a routine part of a male physical exam and can help detect issues such as testicular cancer, hernias, infections, or other abnormalities. Here is how a typical scrotal exam is conducted:

### Preparation

1. Explain the procedure: to the patient to reduce anxiety and gain consent.
2. Ensure privacy: and provide a gown or drape.
3. Position the patient: either standing or lying down. If checking for hernias, the patient is often asked to stand.

### Examination Steps

#### 1. Inspect the scrotum visually

- Look for symmetry, skin changes, swelling, masses, or discoloration.
- Check for any asymmetry (one testicle may be slightly larger, but dramatic differences may indicate an issue).

#### 2. Palpate the scrotum

- Gently feel the entire scrotum, including the testes, epididymis, and spermatic cord.
- Use both hands, placing the thumb on the front of the scrotum and fingers behind the testicle.
- Gently roll each testicle between your fingers to assess for masses, tenderness, or irregularities. The testes should feel smooth, firm, and oval-shaped.

#### 3. Palpate the epididymis

- This is the soft, tube-like structure at the back of each testicle. Check for swelling, tenderness, or hard nodules, which could suggest infection (epididymitis).

#### 4. Palpate the spermatic cord

- Follow the spermatic cord upward from the epididymis towards the inguinal canal. Ensure there are no masses, varicoceles (enlarged veins), or tenderness.

#### 5. Check for hernias (if indicated)

- Ask the patient to cough or bear down while palpating the inguinal region for any bulges, which could indicate an inguinal hernia.

#### 6. Transillumination (if needed):

- If a mass or swelling is detected, you can shine a light behind the scrotum. Solid masses (like tumors) will not transilluminate, while fluid-filled masses (like hydroceles) will.

A hydrocele often increases in size with activities such as coughing, straining {7}.

### Abnormal Findings to Note

- Hard lumps or masses (could indicate testicular cancer).
- Swelling (could be a sign of infection, trauma, or hydrocele).
- Pain or tenderness (could suggest infection or torsion).
- Varicose veins (varicocele).

Always follow up on any abnormal findings with appropriate investigations, such as ultrasound or referral to a specialist.

### Investigations

- **Ultrasound:** The gold standard imaging modality for evaluating testicular lumps. It can differentiate solid from cystic lesions and help in identifying features suggestive of malignancy {8}.

- Of note a negative ultrasound does not exclude cancer and should be repeated six to eight weeks for indeterminate findings on ultrasound, examination and normal serum tumour markers {8}.

**Blood Tests:** Including tumor markers such as alpha-fetoprotein (AFP), beta-human chorionic gonadotropin ( $\beta$ -hCG), and lactate dehydrogenase (LDH) for suspected malignancy {9}.

- **Urinalysis:** To check for infection or hematuria.

- **Sexually Transmitted Infection (STI) Screening:** If there is a risk of STIs contributing to the symptoms. Scrotal pain due to Epididymitis may be sexually transmitted or via an enteric source such as E. coli {11}.

## Management Strategies

### Benign Conditions

#### Hydrocele

- **Observation:** If asymptomatic, as many resolve spontaneously.

- **Aspiration and Sclerotherapy:** For persistent or symptomatic cases.

- **Surgery:** Hydrocelectomy is indicated for large or recurrent hydroceles {6}.

#### Epididymal Cyst and Spermatocele

- **Observation:** Asymptomatic cases often require no treatment.

- **Surgical Excision:** If symptomatic or causing discomfort.

#### Varicocele

- **Conservative Management:** Scrotal support and analgesia for mild cases.

- **Surgical Ligation or Embolization:** For significant pain or infertility issues {4}.



**Epididymitis/Orchitis**

- Antibiotics: Based on the likely causative organism (e.g., doxycycline or ceftriaxone for suspected STI, ciprofloxacin for urinary pathogens) {12}.
- Supportive Care: Including scrotal elevation, ice packs, and analgesia.

**Malignant Conditions****Testicular Cancer**

- Urgent Referral: To a urologist or oncologist.
- Orchiectomy: Surgical removal of the affected testicle is the primary treatment {8}.
- Staging and Further Treatment: Depending on the type and stage of cancer, may include chemotherapy, radiotherapy, and retroperitoneal lymph node dissection {8}.
- Follow-Up: Regular follow-up with imaging and tumor markers to monitor for recurrence.

**Acute Conditions****Testicular Torsion**

- Immediate Referral: To emergency services for surgical intervention.
- Detorsion and Fixation: Within 6 hours to salvage the testicle {3}.

**Patient Education**

Education and reassurance are critical components of managing testicular lumps. Key points include:

**Self-Examination:** Educating patients on how to perform regular testicular self-examinations to detect any changes early.

**Signs and Symptoms:** Informing patients about warning signs that require immediate medical attention, such as sudden severe pain or a rapidly enlarging mass.

**Follow-Up:** Emphasizing the importance of follow-up appointments to monitor the condition and ensure appropriate management.

**Key Points**

- The management of testicular lumps in primary care involves a structured approach to history taking, physical examination, appropriate investigations, and timely referrals.
- While many testicular lumps are benign and can be managed conservatively, the primary care provider must maintain a high index of suspicion for malignancy and other serious conditions that require urgent intervention.
- Educating patients about testicular health and encouraging regular self-examinations can aid in early detection and improve outcomes.

By following these guidelines, primary care providers can effectively manage testicular lumps and ensure the best possible care for their patients.

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# Drug Utilization Pattern in the Management of Chronic Obstructive Pulmonary Disease (COPD) in a Tertiary Care Hospital of Nepal

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Received: February 2025. Accepted: February 2025; Published: April 1, 2025.

Citation: Binod Raut, Sushil kharel, Subash Pant. Drug Utilization Pattern in the Management of Chronic Obstructive Pulmonary Disease (COPD) in a Tertiary Care Hospital of Nepal. World Family Medicine. April 2025; 23(2): 10-15

DOI: 10.5742/MEWFM.2025.95257853

## Abstract

**Background:** Chronic obstructive pulmonary disease (COPD) is one of the major causes of death around the world. Early detection and management can decrease disease progression and mortality. COPD cannot be managed with monotherapy and requires multidrug therapy. The present study planned to assess the drug utilization pattern in COPD patients.

**Aim and Objective:** The aim of the study was to assess the pattern of common drugs used in COPD patients.

**Materials and Methods:** This study was conducted in the Department of Pharmacology, Kathmandu Medical College and Teaching Hospital, Nepal. According to study protocol, a total of 160 patients were included in the study. All the patients' demographic, clinical and medication details were collected and analyzed.

**Results:** A total of 160 COPD patients were analyzed. Among them 101 were males and 59 were females. The mean age of the study population was  $61.87 \pm 6.85$ . The corticosteroids were the most common drugs prescribed (26.53%) followed by LABA and anticholinergics.

**Conclusion:** The study results concluded that most of the patients were taking corticosteroids. The main predisposing factor for COPD was found to be smoking.

**Key Words:** Chronic Obstructive Pulmonary Disease, Drug Utilization, Adverse Drug Reaction

## Introduction

Chronic obstructive pulmonary disease (COPD) is a common disease affecting 10% of the global population and has significant morbidity and mortality (1). Chronic obstructive pulmonary disease (COPD) is one of the common diseases related to respiratory tract with progressive and treatable condition. The vital characteristic feature of COPD is an irreversible airflow restriction (2). One of the prominent events in COPD is an exacerbation which is described as the presence of worsening symptoms along with local and systemic inflammation. COPD is one of the most serious health issues globally. According to WHO, 65 million people have moderate to severe Chronic obstructive pulmonary disease. COPD usually remains under detected and under managed making it fifth cause of morbidity and mortality in developed world (3). Drug utilization study is an evaluation tool to identify the problems regarding drug use and helps prescribers to create awareness about rational drug use. It provides useful patterns into recent prescribing practices and can help to re-establish and update utilization practices in respiratory medicine and pharmacotherapy (4). Obstructive airway disease can be detected by spirometry and other type of lung function tests. Spirometry and the calculation of FEV1/FVC allow us to identify obstructive or restrictive ventilatory defects (5). General aim for COPD management are symptoms control, maintaining normal physiological performance, minimizing the risk of exacerbations, fixed airway obstructions, and adverse effects of the pharmacotherapy. Inhalation therapy is preferred in COPD as it provides high local concentrations, lesser side effects, and good tolerance (6). Drugs used in the management of COPD include short and long-acting  $\beta$ -2 receptor agonists, corticosteroids, theophylline, short and long-acting muscarinic antagonists, roflumilast, antibiotics and mucolytics (7). It was found that selection of drugs principally depends on pharmacokinetics, pharmacodynamics, and comorbid conditions. According to different studies, short-acting beta agonists are the first choice followed by steroids, mast cell stabilizers, and antibiotics. GOLD strategy is the most recommended method for the treatment of COPD patients (8, 9).

Drug utilization evaluation (DUE) is mainly used to evaluate the drug use pattern; use of irrational drugs; intervention to improve and update the drugs used and quality control. Taken together, treatment of COPD mostly requires multiple drug therapy with proper assessment and monitoring.

## Methods

**Study design and duration:** This study was conducted in Department of Pharmacology after obtaining clearance and approval from the Institutional Review Committee (IRC) of Kathmandu Medical College. It was a prospective, observational study, conducted on 160 consecutive cases of COPD over a period of 6 months from July 2024 to December 2024 in the internal Medicine OPD of Kathmandu Medical College, Nepal.

### Inclusion criteria:

- Patients of all age groups (45-75) having COPD as the primary diagnosis attended the outpatient Department of Medicine.

### Exclusion criteria:

- Patients having tuberculosis.
- Patients admitted in Intensive Care Unit (ICU).
- Pregnant women.
- Patients not intending to participate.

### Study procedure:

A written informed consent was taken from each patient involved in the study. Relevant data which included the following details were personally collected by the investigators from all patients.

- Demographic data: patient age, gender
- Smoking history
- Disease condition details
- Drug prescribed for treating COPD were assessed and analyzed as per GOLD treatment guidelines (10), disease severity was categorized according to guidelines (11).

**Statistical Analysis:** The data was analyzed with the help of Microsoft Excel software.

## Results

Table 1: Demographic parameters of the study population (N=160)

Gender	Number of Patients	Percentage
<i>Male</i>	101	63.12%
<i>Female</i>	59	36.88 %

Table 2: Age wise distribution of the study population (N=160)

Age	Number of Patients	Percentage
<i>45-55</i>	20	12.5 %
<i>56-65</i>	59	36.87 %
<i>66-75</i>	81	50.62 %

Table 3: Status of patients with smoking tendency (N=160)

Smoking Status	Number of Patients	Percentage
<i>Current Smoker</i>	46	28.75 %
<i>Ex-Smoker</i>	88	55.00 %
<i>Non Smoker</i>	26	16.25 %

Table 4: Comorbid conditions of the study population

Comorbid condition	Number of patients	Percentage
<i>Hypertension</i>	36	39.13 %
<i>Type 2 Diabetes</i>	15	16.30 %
<i>Ischemic Heart Disease</i>	12	13.04 %
<i>Hypothyroidism</i>	08	08.69 %
<i>Rheumatic Arthritis</i>	07	07.60 %
<i>Anaemia</i>	03	03.26 %
<i>Others</i>	11	11.98 %

Table 5: Class-wise prescription of drugs for the management of COPD (N=160).\

Class of Drugs	Number of Patients	Percentage
<i>Corticosteroids</i>	130	26.53 %
<i>SABA(Short-Acting Beta Agonists)</i>	59	12.04 %
<i>LABA(Long-Acting Beta Agonists)</i>	95	19.38 %
<i>Antibiotics</i>	65	13.26 %
<i>Anticholinergics</i>	76	15.51 %
<i>Methylxanthines</i>	44	08.97 %
<i>Leukotriene modifiers</i>	21	04.28 %

**Table 6: Antibiotics prescribed to the patients**

Antibiotics	Number of Patients	Percentage
<i>Amoxicillin+Potassium clavulanate</i>	18	27.69 %
<i>Doxycycline</i>	22	33.84 %
<i>Cephalosporins</i>	07	10.76 %
<i>Azithromycin</i>	11	16.92 %
<i>Clarithromycin</i>	05	07.69 %
<i>Levofloxacin</i>	02	03.07 %

A total of 160 prescriptions of COPD patients were collected from the department of internal medicine. Out of all 160 patients, 101 (68.12%) patients were males and 59(36.88%) patients were females (Table 1). Most of the patients were either ex-smokers (55%) or smokers (28.75%) with only 10.9% non-smokers (Table 3). The most common associated comorbidities were hypertension (39.13%) and Type II diabetes (16.30%) in the study population (Table 4). Figure 2 shows that the most frequently prescribed group was corticosteroids (26.53%) followed by LABA and anticholinergics. In the management of COPD patients, 51% received inhalation, 39 % received oral and 10 % parenteral (Figure 1). It was observed that maximum numbers of patients were using nebulizer (97.33%). About 62.76% of drugs were prescribed from essential drug list (Table 6).

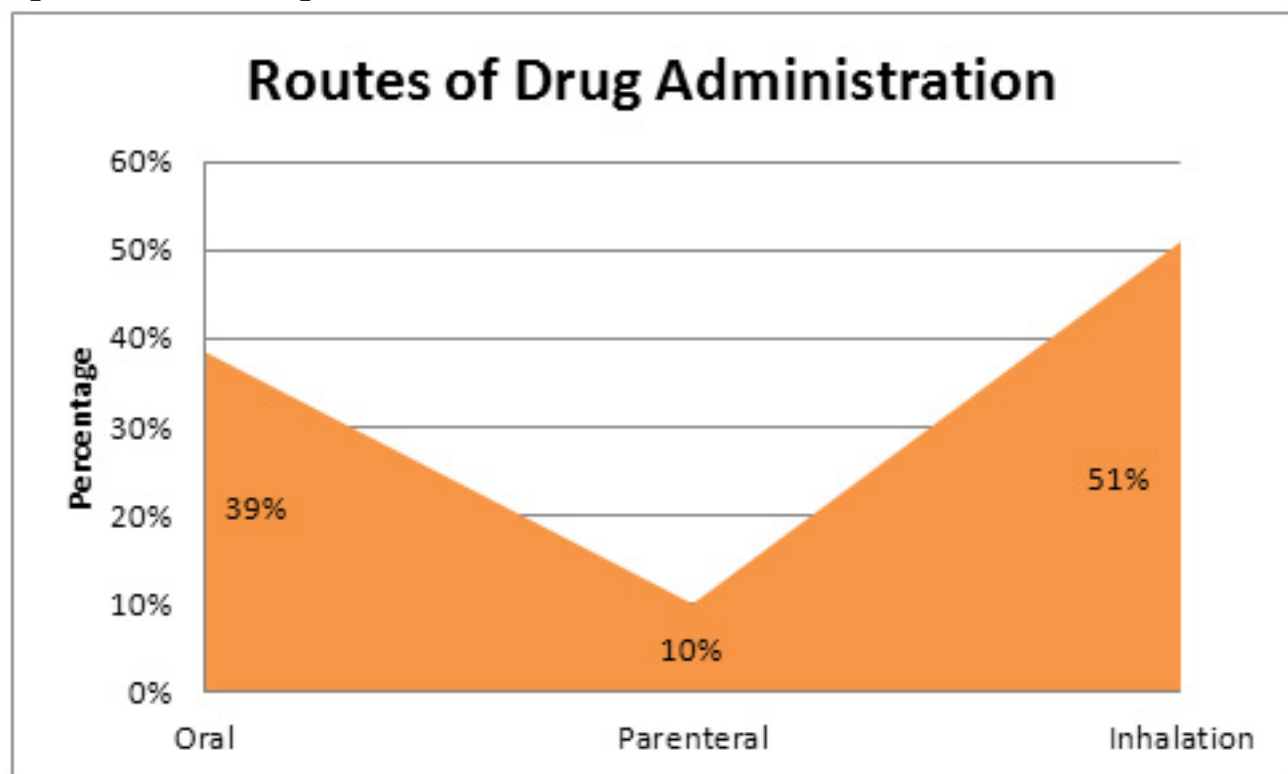
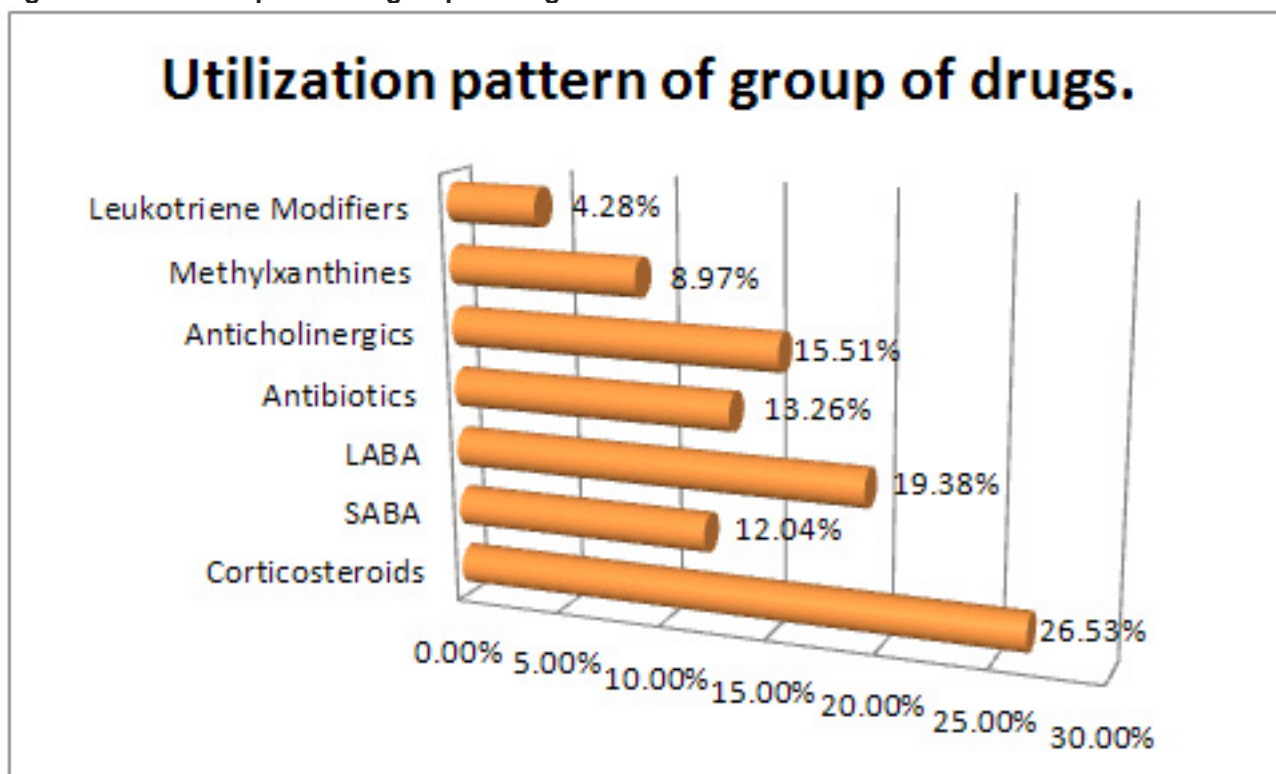
**Figure 1: Routes of drug administration**

Figure 2: Utilization pattern of group of drugs



## Discussion

This study was done on 160 COPD patients. Treatment of COPD with multiple complications needed multiple drug therapy with minimal ADRs. Selection of medicine is the major challenge to manage COPD.

Drug utilization studies are important in facilitating rational drug use (12). These studies can help hospitals to evaluate and improve the prescribing and administration of medications (13).

In our study, it was observed that there were a greater number of male patients (68.12%) than female patients (36.88%). This is similar to a previous study by Niffy et al. in which male patients (75.2%) were more compared to female patients (24.8%) (14).

We found history of smoking in 83.75% of patients which is in line with the study of and Maryam M. Hypertension was most common comorbid condition among our study population which is similar to the results obtained from the study of Sawant MP et al (15) and Unni A et al (16).

In the present study, all the patients are aged between 45 and 75 years. It was observed that middle age to old age people are more prone to COPD. A study was done by Koul et al. showed that COPD incidence was more among the age between 60 and 70 years (17).

According to COPD treatment guidelines, inhalers are the most common method of drug delivery to increase patient compliance. The major cause of for increase in the usage of inhalers is easy to carry and administration. Our study also showed most of the patients preferred inhalers compared to oral or injectable. Dhand et al (18).

## Conclusion

In conclusion, this study shows the drug utilization patterns that were used in the treatment of COPD in a tertiary care hospital of Nepal

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# Prevalence of undiagnosed Depression among adult Type 2 diabetic patients attending Adan Primary Health Care Center in Kuwait

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Received: February 2025. Accepted: February 2025; Published: April 1, 2025.

Citation: Huda Youssef Al-Ghareeb, Khaled E.A.M.Al-Zayed, Mohammad Essam Albaba. Prevalence of undiagnosed Depression among adult Type 2 diabetic patients attending Adan Primary Health Care Center in Kuwait. World Family Medicine. April 2025; 23(2): 16-33  
DOI: 10.5742/MEWFM.2025.95257854

## Abstract

### Aim

1. To determine the prevalence of undiagnosed depression among adult Type 2 diabetes in diabetic clinic in Adan Health Care Center in Kuwait.
2. To assess the importance of depressive symptoms for the management of glucose metabolism in the treatment of diabetes.
3. To determine if depression is associated with variables indicating risk for development of diabetes complication.

**Keywords:** Depression, Type 2 diabetes, BDI, PHQ-9



## Introduction

Diabetes mellitus is a growing public health concern in Kuwait parallel with the worldwide diabetes pandemic (1, 2, 3, 4, 5, 6) due to abnormal glucose metabolism. It is the most common metabolic and endocrine disorder. According to World Health Organization (WHO)-2011 there were 346 million diabetic patients worldwide. This number will be doubled in 2030. (3).

Type2 DM is a chronic lifelong but treatable disease be caused by either insulin resistance or defective insulin secretion or by a combination of these processes. (7, 9, 10).

Likewise, depression is a major health problem with high prevalence worldwide. (8,9). It is a mood disorder in which the depressed person can feel. Worthless, guilt, loneliness, sadness, hopelessness, inefficiency, dissatisfaction, loss of energy and interest, low self-esteem, changes in appetite and sleep patterns are unable to feel joy and happiness. (3).

In fact, depression is expected to be the second leading cause of disability for all age groups by the year 2030. (8). It is also a modifiable risk factor the treatment of which could improve glycemic control and health outcomes in-patient with type 2 diabetes. (10).

Worldwide, the prevalence of mood and anxiety disorders is higher among persons living with diabetes compared to those without diabetes (4, 6, 10, and 18).

The increased risk of early mortality and a severe impact on quality of life and reduction in life expectancy has been found to be associated with both conditions at higher rates than either condition alone. (4, 10,11,12,13, 14).

Co-morbid depression among individuals with diabetes is associated with poor glycemic control via alteration in neurotransmitter functioning, hormonal deregulation, and disruption of diabetes self-management and with an increased prevalence of complications in Type 2 diabetes. (10, 11, 14)

Relationship between depression and diabetes is a self-perpetuating cycle resulting in adverse long-term glycemic control further worsening the risk of developing long-term complications/end-organ damage, increased hospitalization, and even mortality. (4).

Type 2 diabetes is a chronic illness that requires continuing medical care, education, and diligent patient self-management to prevent acute complications and to reduce the risk of long-term complications. Depression is a modifiable risk factor the treatment of which could improve glycemic control and health outcomes in patients with type 2 diabetes. (10).

The IDF recommends the inclusion of a mental health specialist in the multidisciplinary team for diabetes and indicates the need for counseling the person with diabetes in the context of on going diabetes education and care. (28).

## Methods

### Study design, setting and duration:

This descriptive cross-sectional study was conducted over a period of one year in Kuwait in Adan Health Center by using a Beck Depression Inventory (BDI) questionnaire and the patient's Health Questionnaire-9(PHQ-9). The BDI questionnaire is self-administered taking 5-10 minutes to complete. Each item assessed certain specific areas of functioning (self-esteem, quality of life, mood, communication and social interaction, appetite and weight, trouble sleeping). The PHQ-9 questionnaire consists of nine questions about the criteria for diagnosing major and minor depression.

Expedited ethics approval was obtained from the Kuwait Standing Committee for Coordination of Health and Medical Research. All respondents provided informed consent.

### Inclusion and exclusion criteria:

The inclusion criteria was all Type 2 DM who were followed up at the Diabetic clinic for more than 3 months (Kuwaiti and non- Kuwaiti patients), provided that they belonged to the 18-70 years age group and were able to fill in questionnaires by themselves.

The exclusion criteria was all patients younger than 18 years or older than 70 years, patients not able to fill out the questionnaire for any reason, individuals with diabetes other than Type 2 DM (Type 1 DM, Gestational DM, secondary diabetes among others) and mentally ill patients (any patients who were diagnosed as having any kind of depressive disorder, on antidepressant medication).

### Data collection Tool:

The structured questionnaire consisted of questions that covered several areas:

- (1) The socio-demographic data like age, sex, nationality, occupation, education, marital status, income.
- (2) Life style factors like diet, physical activity, smoking status and alcohol consumption.
- (2) The disease characteristics like duration, pharmacological treatment of diabetes, complications and co-morbidity like hypertension, IHD, BA, hypothyroidism.
- (3) The metabolic control measured by HbA1c levels (%) for estimating glycemic control over the last 90-120 days. HbA1c level was categorized as: (good glycemic control <7%), (fair glycemic control 7-8%) and (>8% considered as poor glycemic control).

(4) Hypertension was determined in accordance with AACE and ADA guidelines recommended targets <130/80mmHg for patients with hypertension and diabetes.

(5) Dyslipidemia was determined in accordance with AACE guidelines:

-Total cholesterol: desirable<5.17, borderline high: 5.17-6.18, high >6.21.

-HDL cholesterol: good>1 in males and > 1.2 in females and bad<4 in males and females.

- LDL: optimal <2.6, near optimal 2,6-3.3 and borderline high 3.4.

- TG: normal <1.7, borderline high 1.8-2.2 and high 2.3-5.6.

(6) BMI was measured through dividing weight(kg) by squared height (m) and the range 18.5-24.9 was considered normal, 25-29.5 as overweight, and  $\geq 30$  as obese.

(6) The Beck Depression Inventory (BDI) questionnaire:

The Beck Depression Inventory (BDI), a 21 item-screening questionnaire comprising 13 cognitive and 8 somatic questions was used to assess motivational, cognitive and somatic symptoms of depression. Each item of the inventory scores ranging from 0-3 points indicated the severity of the Depressive symptoms (total scores >17 showing moderate to severe depressive symptoms).

(7) The PHQ-9 questionnaire:

The PHQ-9 questionnaire was considered according to the following algorithms: a severity score of 0-3 was assigned to each item, (0=2- days, 2=7-11 days and 3=12-14 days) yielding a total score between 0 and 24 points. A PHQ score  $\geq 10$  has been recommended as a cutoff point for depression.

#### Data Analysis:

Statistical analysis was carried out using a Statistical Package for Social Sciences SPSS version 17). Frequencies were utilized for categorical variables; mean and standard deviation was obtained for continuous variables. Data were expressed as "mean" (standard deviation; SD) and percentage (%) where appropriate. All tests used a significance level of  $p$  value < 0.05.

## Results

There were 200 participants (92 males, and 108 females) with type 2 DM. 22 patients were omitted because of the lack of investigations required. (11.5%) of the total participants were depressed with (9.5%) experiencing mild depression and (1.1%), a small proportion, moderate depression and no one had severe depression. The variables such as advancing age, income, LDL, and TG were found as a major determinant of depression in our study.

Participants in the study ranged in age from 21 to above 60 with a mean age ( $\pm$  standard deviation) of  $4.1+1.01$  years. (54%) of them were females and (46%) were males with a mean gender  $1.54+0.49$ . (71%) of them were Kuwaiti and (29%) were non-Kuwaiti with a mean

nationality  $1.29+0.45$ . The majority of them were married (76%) and the rest were single, divorced or widowed (24%) with a mean marital status  $2.1+0.69$ . (40.4%) of them were working and (59.5%) were not working with a mean occupation  $1.59+0.49$ . (28%) of them had high school level of education, (20%) had Bachelor education, (0.5%) had Master education, (1%) had Doctorate education and the remaining (50%) had other level of education with a mean level of education  $3.24+1.81$ . The majority of the participants had income below 1000 K.D (48%), while the minority had income above 3000 K.D (2%) and the remaining of the participants refused to respond (12%) with a mean income of  $2+1.31$ .

The prevalence of depression varied with the duration of DM diagnosis in years with depression rates higher in those with less than 5 years of diabetes duration, with a decrease in prevalence as the duration increased. Up to 5 years duration, Mild depression occurs in (5%), moderate depression occurs in (1%). In 5-10 years duration, Mild depression occurs in (0.5%) and moderate depression occurs in (0.5%). In more than 10 Y duration mild depression occurs in (4%) and moderate depression occurs in (0.5%) with a mean of  $2.1+0.87$ .

The prevalence of depression also varied with the management of diabetes. (6%) had mild depression and (1%) had moderate depression for patients on OHA. (1.5%) had mild depression only for patients who had Injectable treatment and (2%) had mild depression and (1%) had moderate depression for patients who had Injectable treatment with a mean of  $1.83+0.95$ .

Regarding smoking and alcohol, (17.5%) of the participants who were smokers, (1.5%) of them had mild depression and (0.5%) had moderate depression with a mean of  $1.82+0.38$ . (1.5%) of the participants who were consuming alcohol had no depression with a mean of  $1.98+0.12$ .

Regarding the participants with complication of diabetes (14.5%) of those with diabetic retinopathy had (0.5%) mild depression and (0.5%) had moderate depression, while (6%) of participants who had diabetic neuropathy, (1%) had mild depression and (0.5%) had moderate depression and those who had diabetic nephropathy (1%) had no depression with a mean of  $1.34+0.78$ .

Among participants with associated co-morbid conditions, depression was shown to be present in some co-morbid conditions. Hypertensive participants had (6%) mild depression and (1%) moderate depression. Osteoarthritic participants had (1%) mild depression only with a mean of  $3.29+2.54$ . Dyslipidemia participants had (1.5%) mild depression and (0.5%) moderate depression.

Among the participants who had elevated systolic BP, (2.5%) had mild depression and (0.5%) had moderate depression. Those who had stage 1 systolic BP, (3%) had mild depression and (1%) had moderate depression. and those who had stage 2 systolic BP, (3%) had mild depression and (0.5%) had moderate depression with

a mean of  $1.34 \pm 1.5$ . On the other hand, the participants who had elevated diastolic BP, (0.5%) had (6%) mild depression and (0.5%) had moderate depression. Those who had stage 1&2 diastolic BP, (1%) had mild depression and (0.5%) had moderate depression with a mean of  $1.2 \pm 0.59$ .

Among participants who were compliant to the diet had (4%) mild depression only, but those who were not compliant to the diet had 11(5.5%) had mild depression and (2%) moderate depression with a mean of  $1.69 \pm 0.46$ .

On the other hand, the participants who were compliant with physical activity had (4.5%) mild depression only, but those who were not compliant to physical activity had (5%) mild depression and (2%) moderate depression with a mean of  $1.69 \pm 0.46$ .

Among 14% of participants who had BMI < 25, (1%) had mild depression and (0.5%) had moderate depression. Among 41.5% BMI 25-29.9, (6.5%) had mild depression and (0.5%) had moderate depression. and among 44.5% BMI  $\geq$  30, (2%) had mild depression and (1%) had moderate depression with a mean of  $2.3 \pm 0.70$ .

Among the entire sample of patients uncontrolled those who had- HbA1 more than  $\geq 7$  had (3.5%) mild depression and (1%) had moderate depression. While HbA1 <7 had (6%) mild depression and (1%) moderate depression with a mean  $1.6 \pm 0.48$ .

The distribution and severity of depression was significantly higher for Age of participants ( $p=0.006$ ), income ( $p=0.006$ ), LDL ( $p=0.00$ ) and TG ( $p=0.065$ ). Several demographic and disease-related variables emerged as significant independent predictors of depression as gender ( $p= 0.223$ ), nationality ( $p= 0.947$ ), occupation ( $p=0.477$ ), mental status ( $p=0.144$ ), level of education ( $p=0.986$ ), smoking( $p=0.907$ ), alcohol ( $p=0.820$ ), systolic BP ( $p=0.950$ ), diastolic BP ( $p=0.274$ ), HbA1c ( $p=0.872$ ), total cholesterol ( $p=0.221$ ), HDL for females ( $p=0.553$ ), HDL for males ( $p= 0.526$ ), the methods of controlling DM ( $p=0.238$ ), complication ( $p=0.476$ ), co-morbidity ( $p=0.432$ ), diet ( $p=0.224$ ), physical activity ( $p=0.118$ ), BMI ( $p=0.138$ ) and duration of DM ( $p=0.179$ ).

### 1. The association between Depression and social demographics:

**Gender:** The prevalence of depression varied with the difference in gender of the diabetic patient. Among 108 female participants (6.5 %) of them had mild depression and (0.5%) had moderate depression, while of the (46%) male patients, (0.03 %) of them had mild depression and (1.5%) had moderate depression. These results were not statistically significant ( $p= 0.223$ ) and there is no correlation between depression and gender ( $r=0.011$ ) as shown in Table 1.

**Table 1: The association between Depression and gender:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
Gender								
Male	83(41.5%)	6(3%)	3(1.5%)	-	92(46%)	1.54	0.499	0.223
Female	94(47%)	13(6.5%)	1(0.5%)	-	108(54%)			

**Age:** The prevalence of depression was not present in 21-29 age groups of the study participants. Of those aged between 30-39 Y, (2.5%) had mild depression whereas those aged between 40-49 years, (1.5%) had mild depression and (1.5%) had moderate depression. Of those aged between 50-59 years, (1.5%) had mild depression and lastly those whose age group was above 60, (4%) had mild depression and (0.5%) had moderate depression.

The analysis revealed that there was statistical significance ( $p=0.006$ ) between depression and the age of the patients and there is a weak correlation between depression and age ( $r= 0.165$ ) as shown in Table 2.

**Table 2: The association between Depression and age:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
Age in Years						4.16	1.019	0.006
-21-29Y	2(1%)	0	0	-	2(1%)			
-30-39Y	10(5%)	5(2.5%)	0	-	15(7.5%)			
-40-49Y	27(13.5%)	3(1.5%)	3(1.5%)	-	33(16.5%)			
-50-59Y	46(23%)	3(1.5%)	0	-	49(24.5%)			
-≥ 60	92(46%)	8(4%)	1(0.5%)	-	101(50%)			

**Nationality:** Depression was shown to be present in Kuwaiti and non- Kuwaiti Nationality. Among (71%) Kuwaiti participants (7%) had mild depression and (1.5%) had moderate depression and among non- Kuwaiti nationality (2.5%) had mild depression and (0.5%) had moderate depression. The analysis revealed that there was no statistical significance between depression and the nationality of the participants ( $p=0.947$ ) and there is no correlation between depression and nationality ( $r=0.023$ ) as shown in Table 3.

**Table 3: The association between Depression and nationality:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Age in Years</b>						4.16	1.019	0.006
-21-29Y	2(1%)	0	0	-	2(1%)			
-30-39Y	10(5%)	5(2.5%)	0	-	15(7.5%)			
-40-49Y	27(13.5%)	3(1.5%)	3(1.5%)	-	33(16.5%)			
-50-59Y	46(23%)	3(1.5%)	0	-	49(24.5%)			
-≥ 60	92(46%)	8(4%)	1(0.5%)	-	101(50%)			

**Total income:** The prevalence of depression was not present for participants whose income is between 2000-3000 K.D. Of those with income less than 1000 K.D, (4%) had mild depression and (0.5%) had moderate depression. Of those with income between 1000-2000 K.D, (2.5%) had mild depression and (0.5%) had moderate depression. Of those with income above 3000, (0.5%) had moderate depression. The participants who refused to respond had (3%) mild depression and (0.5%) depression.

These results were statistically significant ( $p=0.006$ ) between depression and the income of the diabetic patients and there is a weak correlation between depression and income ( $r=0.173$ ) as shown in Table 4.

**Table 4: The association between Depression and total income:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Income</b>						2.000	1.314	0.006
-≤ 1000 K.D	87(43.5%)	8(4%)	1(0.5%)	-	96(48%)			
-1000-2000 K.D	54(27%)	5(2.5%)	1(0.5%)	-	60(30%)			
-2000-3000 K.D	16(8%)	0	0	-	16(8%)			
-≥ 3000 K.D	3(1.5%)	0	1(0.5%)	-	4(2%)			
-Refused to respond	17(8.5%)	6(3%)	1(0.5%)	-	24(12%)			

**Occupation:** The prevalence of depression was present for the occupied participants as (5%) had mild depression and (1%) had moderate depression while the non-occupied participants had (4.5%) mild depression and (1%) moderate depression. The results showed a statistical non-significance between occupation and depression ( $p=0.477$ ) and there is no correlation between them ( $r=0.079$ ) as shown in Table 5.

**Table 5: The association between Depression and occupation:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Occupation</b>						1.59	0.492	0.477
-Working	69(34.5%)	10(5%)	2(1%)	-	81(40.4%)			
-Not working	108(54%)	9(4.5%)	2(1%)	-	119(59.5%)			

**Marital status:** The prevalence of mild depression was present in single status (1.5%) while married status had (8%) mild depression and (15%) moderate depression, widow and divorced status had both (0.5%) moderate depression only. The results showed a statistical non significance between marital status and depression ( $p=0.174$ ) and there is no correlation between them ( $r=0.039$ ) as shown in Table 6.

**Table 6: The association between Depression and marital status:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Marital status</b>						2.190	0.690	0.174
-Single	11(5.5%)	3(1.5%)	0	-	14(7%)			
-Married	134(67%)	16(8%)	2(1%)	-	152(76%)			
-Widow	15(7.5%)	0	1(0.5%)	-	16(8%)			
-Divorced	17(8.5%)	0	1(0.5%)	-	18(9%)			

**Level of Education:** The prevalence of depression varied with the level of education. Of the 28% high school level of education, (3%) had mild depression and (1%) had moderate depression. Of the 20% Bachelor level of education, (2%) had mild depression and (0.5%) had moderate depression. Of the 0.5% Master level of education, (2%) had only mild depression. Others at 50% such as illiterate or diploma education had (4.5%) mild depression and (0.5%) had moderate depression. The results were statistically not significant ( $p=0.986$ ) and there is no correlation between depression and level of education ( $r=0.074$ ) as shown in Table 7.

**Table 7: The association between Depression and level of education:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Level of Education</b>						3.24	1.814	0.986
-High school	48(24%)	6(3%)	2(1%)	-	56(28%)			
-Bachelor degree	36(18%)	4(2%)	1(0.5%)	-	41(20%)			
-Master degree	1(0.5%)	4(2%)	0	-	1(0.5%)			
-Doctorate	2(1%)	0	0	-	2(1%)			
-Others	90(45%)	9(4.5%)	1(0.5%)	-	100(50%)			

**Smoking status:** (17.5%) of the participants were smokers among who (1.5%) had mild depression and (0.5%) had moderate depression. The results were statistically not significant ( $p=0.907$ ) and there is no correlation between depression and smoking status ( $r=0.009$ ) as shown in Table 8.

**Table 8: The association between Depression and smoking status:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Smoking status</b>						1.825	0.380	0.907
-Yes	31(15.5%)	3(1.5%)	1(0.5%)	-	35(17.5%)			
-No	146(73%)	16(8%)	3(1.5%)	-	165(82.5%)			

**Alcohol consumption:** (1.5%) of participants who were consuming alcohol had no depression. The results were statistically not significant ( $p=0.820$ ) and there is no correlation between depression and alcohol consumption ( $r=0.042$ ) as shown in Table 9.

**Table 9: The association between Depression and alcohol consumption:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Alcohol consumption</b>						1.985	0.121	0.820
-Yes	3(1.5%)	-	-	-	3(1.5%)			
-No	174(87%)	19(9.5%)	4(2%)	-	197(98.5%)			

## 2. The association between complications of Diabetes and depression:

The total number of participants who had no complications was (78.5%) with (8%) who had mild depression and (15%) moderate depression. While those participants who had diabetic retinopathy (14.5%) had (0.5%) mild depression and (0.5%) moderate depression. (6%) who had diabetic neuropathy had (1%) mild depression and (0.5%) moderate depression. Those who had diabetic nephropathy (1%) had no depression.

The results were statistically significant ( $p=0.437$ ) and there is no correlation between depression and complication of type 2 DM ( $r=0.092$ ) as shown in Table 10.

**Table 10: The association between Depression and complication of diabetes:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Complication</b>						1.345	0.780	0.476
-Nil	139(69.5%)	16(8%)	2(15%)	-	175(78.5%)			
-Retinopathy	27(13.5%)	1(0.5%)	1(0.5%)	-	29(14.5%)			
-Nephropathy	2(1%)	0	0	-	2(1%)			
-Neuropathy	9(4.5%)	2(1%)	1(0.5%)	-	12(6%)			
-Skin ulcer	0	0	0	-	0			
-AMI	0	0	0	-	0			

**3. The association between the co-morbid conditions of Diabetes and depression:** Depression was shown to be present in some co-morbid conditions associated with type 2 DM. Among (65%) hypertensive participants, (6%) had mild depression and (1%) had moderate depression. Among (18.5%) of dyslipidemia participants, (1.5%) had mild depression and (0.5%) had moderate depression. Among (1.5%) osteoarthritic participants, (1%) had mild depression only. The results were statistically significant ( $p=0.432$ ) and there is no correlation between depression and co-morbid conditions of type 2 DM ( $r=0.026$ ) as shown in Table 11.

**Table 11: The association between Depression and DM with other Co-morbid disease:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Co-morbid conditions</b>						3.290	2.549	0.432
-Nil	16(8%)	2(1%)	1(0.5%)	-	19(9.5%)			
-Diagnosis of hypertension	116(58%)	12(6%)	2(1%)	-	130(65%)			
-Diagnosis of CVD	3(1.5%)	0	0	-	3(1.5%)			
-Diagnosis of CVA/TIA	1(0.5%)	0	0	-	1(0.5%)			
-Diagnosis of PVD	0	0	0	-	0			
-Diagnosis Thyroid	6	0	0	-	6(3%)			
-Diagnosis of COPD	1(0.5%)	0	0	-	1(0.5%)			
-Diagnosis of dyslipidemia	33(16.5%)	3(1.5%)	1(0.5%)	-	37(18.5%)			
-Diagnosis of osteoarthritis	1(0.5%)	2(1%)	0	-	3(1.5%)			

**4. The association between compliance of the participants to diet and physical activity and depression:**

**Diet:** The participants who were compliant to the diet had (4%) mild depression only but those who were not compliant to the diet had (5.5%) mild depression and (2%) moderate depression. The results showed statistical non-significance between diet and depression ( $p=0.224$ ) and there is no correlation between depression and diet ( $r= 0.006$ ) as shown in Table 12.

**Table 12: The association between Depression and compliance to diet:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Diet</b>						1.695	0.461	0.224
-Yes	53(26.5%)	8(4%)	0	-	61(30.5%)			
-No	124(62%)	11(5.5%)	4(2%)	-	139(69.5%)			

**Physical activity:** The participants who were compliant to physical activity had (4.5%) mild depression only but those who were not compliant to physical activity had (5%) mild depression and (2%) moderate depression. The results showed no statistical significance between physical activity and depression ( $p=0.118$ ) and there is no correlation between depression and physical activity ( $r= 0.017$ ) as shown in Table 13

**Table 13: The association between Depression and compliance to physical activity:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Physical activity</b>						1.690	0.463	0.118
-Yes	53 (26.5%)	9(4.5%)	0	-	62(31%)			
-No	124(62%)	10(5%)	4(2%)	-	138(69%)			



### 5.The association between the BMI and depression:

Of the participants who had BMI < 25, (1%) had mild depression and (0.5%) had moderate depression. Those who had BMI 25-29.9, (6.5%) had mild depression and (0.5%) had moderate depression. and those who had BMI ≥ 30, (2%) had mild depression and (1%) had moderate depression.

The results showed statistically non- significance between BMI and depression (p=0.138) and there is no correlation between depression and BMI (r= 0.017) as shown in Table 14.

**Table 14: The association between Depression and the BMI:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>BMI</b>						2.305	0.703	0.138
< 25	25(12.5%)	2(1%)	1(0.5%)	-	28(14%)			
-25-29.9	69(34.5%)	13(6.5%)	1(0.5%)	-	83(41.5%)			
≥ 30	83(41.5%)	4(2%)	2(1%)	-	89(44.5%)			

### 6.The association between systolic BP levels and depression:

The participants who had elevated systolic BP had (2.5%) mild depression and (0.5%) had moderate depression. Those who had Stage 1 Systolic BP, (3%) had mild depression and (1%) had moderate depression and those who had Stage 2 Systolic BP, (3%) had mild depression and (0.5%) had moderate depression. The results showed statistical non-significance between systolic BP and depression (p=0.950) and there is no correlation between depression and systolic BP (r= 0.023) as shown in Table 15.

**Table 15: The association between Depression and systolic BP:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Systolic Blood pressure</b>						1.349	1.550	0.950
1-Normal	18(9%)	2(1%)	0	-	20(10%)			
2-Elevated	50(25%)	5(2.5%)	1(0.5%)	-	56(28%)			
3-High BP (hypertension stage 1)	45(22.5%)	6(3%)	2(1%)	-	53(26.5%)			
4-High BP (hypertension stage 2)	64(32%)	6(3%)	1(0.5%)	-	71(35.5%)			

### 7. The association between diastolic BP levels and depression:

The participants who had elevated diastolic BP (2.5%) had mild depression and (0.5%) had moderate depression. Those who had stage 1&2 diastolic BP, 2(1%) had mild depression and 1(0.5%) had moderate depression.

The results showed statistical non-significance between diastolic BP and depression ( $p=0.274$ ) and there is no correlation between depression and diastolic BP ( $r=0.027$ ) as shown in Table 16.

**Table 16: The association between Depression and diastolic BP**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Diastolic Blood pressure</b>						81.2	7.590	0.274
1-Normal	55(27.5%)	5(2.5%)	2(1%)	-	62(31%)			
2-Elevated	100(50%)	12(6%)	1(0.5%)	-	113(56.5%)			
3-High BP (hypertension stage 1 & stage 2)	24(12%)	2(1%)	1(0.5%)	-	27(13.5%)			

### 8. The association between the HbA1c levels and depression:

While there was no significance and correlation between HbA1c and depression ( $p=0.872$ ). Uncontrolled HbA1 more than  $\geq 7$  had (3.5%) mild depression and (1%) had moderate depression. While HbA1  $<7$  had (6%) mild depression and (1%) moderate depression. The results showed no correlation between depression and HbA1 ( $r=0.023$ ) as shown in Table 17.

**Table 17: The association between Depression and the HbA1c**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>HbA1C</b>						1.625	0.485	0.872
$\geq 7$	66(33%)	7(3.5%)	2(1%)	-	75(37.5%)			
$<7$	111(55.5%)	12(6%)	2(1%)	-	125(62.5%)			

### 9. The association between the total cholesterol and depression :

The prevalence of depression varied with the level of the total cholesterol. Of the (81%) of patients who had normal total cholesterol, (7.5%) had mild depression and (0.5%) had moderate depression. Of the (9%) who had Borderline high total cholesterol, (1%) had mild depression and (0.5%) had moderate depression. Of the (10%) who had High total cholesterol, (1%) had mild depression and (1%) had moderate depression. These results are non-statistically significant ( $p=0.221$ ) and there is a weak correlation between depression and high total cholesterol ( $r=0.187$ ) as shown in Table 18.

Table 18: The association between Depression and the Total cholesterol:

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>Illness profile of the Total cholesterol</b>						4.515	1.255	0.221
<5.17 Normal	146(73%)	15(7.5%)	1(0.5%)	-	162(81%)			
5.17-6.18	15(7.5%)	2(1%)	1(0.5%)	-	18(9%)			
Borderline high	16(8%)	2(1%)	2(1%)	-	20(10%)			
>6.2 High								

**10. The association between HDL cholesterol and depression in women:**

The prevalence of depression varied with the level of HDL cholesterol in women. Of the (37%) of patients who had good HDL cholesterol, (4%) had mild depression and (1.5%) had moderate depression. Of the (63%) who had bad HDL, (5.5%) had mild depression and (0.5%) had moderate depression. These results are statistically non-significant ( $p=0.553$ ) and there is no correlation between depression and high HDL in women ( $r=0.028$ ) as shown in Table 19.

Table 19: The association between Depression and HDL in women:

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>HDL in women</b>						0.744	0.729	0.553
>1.2 good	63(31.5%)	8(4%)	3(1.5%)	-	74(37%)			
<4 bad	114(57%)	11(5.5%)	1(0.5%)	-	126(63%)			

**11. The association between HDL cholesterol and depression in men:**

The prevalence of depression varied with the level of HDL in men. Of the (59%) of patients who had good HDL cholesterol, (1.5%) had mild depression and (1%) had moderate depression. Of the (41%) who had bad HDL, (8%) had mild depression and (2%) had moderate depression. These results are statistically non-significant ( $p=0.526$ ) and there is no correlation between depression and high HDL in men ( $r=0.003$ ) as shown in Table 20.

Table 20: The association between Depression and the HDL in men:

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
<b>HDL in men</b>						0.549	0.637	0.526
>1 good	113(56.5%)	3(1.5%)	2(1%)	-	118(59%)			
<4 bad	64(32%)	16(8%)	2(1%)	-	82(41%)			

### 12. The association between the LDL cholesterol and depression

The prevalence of depression varied with the level of the LDL cholesterol. Of the (19.5%) of patients who had optimal LDL, (4%) had mild depression and (0.5%) had moderate depression. Of the (23%) of patients who had near optimal LDL, (4%) had mild depression and (0.5%) had moderate depression. Of the (57.5%) who had Borderline high LDL, (1.5%) had mild depression and (1%) had moderate depression. These results are highly statistically significant ( $p=0.000$ ) and there is a weak correlation between depression and high LDL ( $r= 0.197$ ) as shown in Table 21.

**Table21: The association between Depression and the LDL:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
LDL						2.447	1.037	0.000
<2.6 optimal	30(15%)	8(4%)	1(0.5%)	-	39(19.5%)			
2.6-3.3 Near optimal	37(18.5%)	8(4%)	1(0.5%)	-	46(23%)			
>3.4 Borderline high	110(55%)	3(1.5%)	2(1%)	-	115(57.5%)			

### 13. The association between TG and depression in women:

The prevalence of depression varied with the level of TG. Of the (33.5%) of patients who had  $TG<1.7$ , (5.5%) had mild depression and (1.5%) had moderate depression. Of the (42.5%) who had borderline highTG, (1%) had mild depression and nobody had moderate depression. Of the (18.5%) who had High TG, (3%) had mild depression and (0.5%) had moderate depression. These results are statistically significant ( $p=0.065$ ) and there is a very weak correlation between depression and high TG ( $r=0.036$ ) as shown in Table 22.

**Table 22: The association between Depression and the TG:**

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
TG						1.791	1.735	0.065
<1.7 Normal	53(26.5%)	11(5.5%)	3(1.5%)	-	67(33.5%)			
1.8-2.2 borderline high	83(41.5%)	2(1%)	0	-	85(42.5%)			
2.3-5.6 High	30(15%)	6(3%)	1(0.5%)	-	37(18.5%)			

### 14. The association between the management of DM and the prevalence of depression:

The prevalence of depression varied with the management of diabetes. Of the (55.5%) of patients on OHA, (6%) had mild depression and (1%) had moderate depression. Of the (6%) who had Injectable treatment (1.5%) had mild depression and nobody had moderate depression. Of the participants on OHA and Injectable (38.5%), (2%) had mild depression and (1%) had moderate depression. These results are statistically non-significant ( $p=0.238$ ) and there is a weak correlation between depression and management of diabetes ( $r=0.107$ ) as shown in Table 23.

Table 23: The association between Depression and the treatment of DM:

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
Treatment of DM	97(48.5%)	12(6%)	2(1%)	-	111(55.5%)	1.830	0.956	0.238
-OHA	7(3.5%)	3(1.5%)	0	-	12(6%)			
-Injectable	71(35.5%)	4(2%)	2(1%)	-	77(38.5%)			
-OHA and Injectable								

**15. The association between duration of diabetes and depression:**

The prevalence of depression varied with the duration of DM diagnosis in years. Mild depression (5%) and moderate depression (1%) happen in up to 5 year duration. Mild depression (0.5%) and moderate depression (0.5%) happen in 5-10 Y duration. Mild depression (4%) and moderate depression (0.5%) happen in more than 10 Y duration. These results showed a statistical non-significance ( $p=0.179$ ) and that there is no correlation between depression and the duration from the time of diagnosis with diabetes was made ( $r= 0.107$ ) as shown in Table 24.

Table 24: The association between Depression and the duration of DM:

Variable	No depression (0-9) No (%)	Mild Depression (10-18) Yes (%)	Moderate depression (19-29) Yes (%)	Severe Depression (30-63) Yes (%)	Total	Mean	SD	P value
Duration of DM diagnosis in years	53(26.5%)	10(5%)	2(1%)	-	65(32.5%)	2.125	0.873	0.179
-Up to 5 Y	43(21.5%)	1(0.5%)	1(0.5%)	-	45(22.5%)			
- 5-10 Y	81(40.5%)	8(4%)	1(0.5%)	-	90(45%)			
->10 Y								

**16. The prevalence of depression:**

It was found that 11.5% of the type 2 diabetic patients have depression. Of these, (9.5%) had mild depression as they scored 10-18 on the BDI while (2%) had moderate as they scored 19-29 on the BDI. None of the study participants had severe depression as shown in Table 25.

Table 25: The prevalence of depression:

Variable	Frequency (%)	Mean	SD	P value
Without depression (0-9)	177(88.5%)	1.135	0.396	0.434
Mild depression (10-18)	19(9.5%)			
Moderate depression (19-29)	4(2%)			
Severe depression (30-63)	-			

## Discussion

Our study showed that depression, particularly in a mild to moderate to form, is much more common among those with diabetes than those without disease. This aligns with several previous studies suggesting increased depressive symptoms in type 2 diabetes including Prerna B(4), Mohammed S (33), Shazia P (34), Vivek S (35), Aatir H (38), Amit R (44), Mohan P (46), Bader Q, and Hala M (52).

Our study showed a higher percentage of significant association between depression in diabetes and **age** (p:0.006). Those above 60 years age group (4.5%) suffered most for mild to moderate depression, similar to other studies including Kiran Niraula (5) Feba Elizabeth (12), Donia K (32), Vivek S (35), Bagher L (36), Shivwani D(37), Amit R(44), Mohan P(46), and Aysha Q(51). Physical and psychological causes in the elderly like retirement, isolation, fear of death and physical inability increase the prevalence of depression in diabetic patients. On the other hand, age was not found to be significantly associated with depression including Akash R (49).

Regarding the **gender** our study showed that depression is more among females (54%) than males (46%), similar to other studies including Ebaa Al-Ozairi (1), saeedeh Alsadat(3),Aminul Hasan (9),Puneet K.C(11), G.K.Vankar(14),Hulya Parildar (21),Namrata C (30),Shamsaei F(31), Vivek S(35), Aatir H(38),Hira M(39),Norouzi Z(40),Abdul Rehman A(45), Mohan P(46), Akash R (49),Shafiepour MR (50), Bader Q, and Hala M.(52).However this reflects the higher prevalence of depression in women in the general population due to different stresses like family, socioeconomic and workplace factors. Other studies findings showed that depression is more prevalent in males as compared to females including Shivwani D (37).

Regarding the nationality, **Kuwaiti** nationality had (8.5%) mild to moderate depression in comparison to (3%) non- Kuwaiti, which is different from another study done previously in Kuwait, including that of Ebaa Al-Ozairi (1).

Depression was seen more frequently in patients who had no formal **education** as mild and moderate depression happens in 4% of high school education, 2.5% in Bachelor, 2% Master and 55 others like Diploma. This finding is consistent with Another study including that of G.K.Vankar(14), Hulya Parildar (21), and Akash R (49). The highest rate of depression occurs if there is lack of knowledge about the illness. On the other hand, the association of diabetes and depression was independent of an individual's education in other studies including Mohammed S (33).

**Duration of diabetes** is another important factor. In our study, there were no significant relationship between depression and disease duration, similar to other study including Saeedeh Alsadat(3), Rasmieh M.Al Amer(18), Donia K(32), Amira S(41), Aysha Q(51). As long disease

duration had no positive correlation with depression, despite that diabetes complication increases with illness duration that affect increased depression risk, but Prerna Bahety(4), Aminul Hasan (9), G.K.Vankar(14), Vivek S(35) reported a significant relationship between depression and disease duration. This suggests that the initial adjustment to diabetes may be more emotionally challenging, while long-term patients may develop better coping mechanisms.

Regarding **marital status**, married persons (9%) showed higher depression than single non married (1.5%), widowed (0.5%) and divorced (0.5%) in our study. This finding is consistent with other studies including Hira M (39), Akash R (49) and is different from results of other studies like Aminul Hasan (9), and Shafiepour MR (50).

In our study, lower **income** was associated with greater depression which was different to results from other studies. Kiran Niraula (5) reported that high personal income was associated with greater depression. On the other hand the association of diabetes and depression was independent of an individual's income in other studies like Mohammed S (33).

In our study there is significant association between depression and **occupation** as depressed patients was found to be more among employed than those who were not employed similar to other studies including Bader Q, Hala M. (52) and different from other studies' findings including Catherine N (48), Akash R (49), and Shafiepour MR (50). This could be due to different work stresses.

Among the study population, 17.5% reported **smoking** in which 2% had mild and moderate depression consistent with the association between smoking and depression reported to other findings, Puneet K.C(11), and 1.5% reported using **alcohol** but no one had mild and moderate depression.

In our study **high blood pressure**, either systolic or diastolic, was associated with greater depression severity, similar to other findings, Kiran Niraula (5). Hypertension, particularly elevated systolic blood pressure, was linked to higher depression prevalence, emphasizing the role of managing cardiovascular health in reducing depressive symptoms.

Among the study population there is no significant relationship between depression and **compliance to dietary and physical activity pattern** as 30.5% on dietary pattern in which 4% had mild depression and 31% on daily physical activity in which 4.5% had mild depression only is different from previous studies including that of Bader Q, Hala M. (52) as the results revealed a significant association between exercise and depression, with the majority of patients with T2DM who did not exercise were more susceptible to depression than those who exercised. These findings highlight how socioeconomic challenges and poor diabetes management can worsen emotional well-being.

In this study there is no significant relationship between depression and **HbA1c control**, similar to other studies including saeedeh Alsadat(3), Zana Stankovic(8), Ashraf Shehatah(10), Puneet K.C(11), Rasmieh M(18) Hulya Parildar(21), Donia K(32), but Ebaa Al-Ozairi(1), Perna Bahety(4), Kiran Niraula (5), Aminul Hasan (9), Bagher L(36), and Chandana K (47) who reported significant relationship between depression and HbA1c control, as elevated HbA1c increased diabetic risk by impairing self-management in diabetic patients and exacerbating insulin resistance.

In our study an analysis of **BMI** showed no significant relationship between depression and BMI, similar to other studies including Feba Elizabeth (12), Abdul Rehman A (45). But other studies including that of Aminul Hasan (9), Sree Lekshmi (27), and Amit R (44). Overweight and obese participants had higher depression rates, reinforcing the connection between obesity and mental health issues in T2DM patients.

In our study an analysis of **HDL cholesterol** in male and female participants showed no significant relationship between depression and DM, similar to another study including Zana Stankovic (8). On the other hand, **LDL cholesterol** showed significant relationship between depression and DM in our study.

In our study patients with DM having no complication were found in (69.5%) of depression compared to patients with DM who had **complications** like retinopathy and neuropathy (2.5%). This finding is in agreement with other studies including saeedeh Alsadat(3), Zana Stankovic(8) G.K.Vankar(14), Shamsaei F (31), Amira S(41), and Amit R(44). Other studies including Bagher L(36), and Chandana K(47) showed association of depression with diabetic complications like cardiovascular symptoms, neuropathy and retinopathy. It is understandable that DM complications increased the frequency of depression and contribute to psychological distress. The more complications the person experiences, the greater the possibility that it is related to developing depressive symptoms.

On analysis of **prescription pattern for diabetes**, it was found that of participants who had mild and moderate depression, 1.5% of them were on injectable alone and 7% of them on OHA and 3% on combination of injectable with OHA. The OHA was associated with a higher frequency of depression which is different from previous studies Perna Bahety(4), Aminul Hasan(9) as insulin had higher frequency of depression. Further population-based studies are needed as our study being a cross-sectional one had a limited sample at one diabetic Center and further longitudinal studies are needed in the future to detect changes overtime.

## Conclusion

This study reveals that individuals with Type 2DM are at a significantly higher risk of developing depressive symptoms compared to the general population. The presence of depression in diabetic patients has been associated with reduced adherence to treatment, inadequate self-care practices, and

diminished quality of life. Factors such as diabetes distress, lifestyle changes, social isolation, and concerns over long-term complications further contribute to the psychological burden experienced by these patients.

Psychological assessment in every diabetic patient is a must for better quality of life and prognosis.

Healthcare providers should incorporate mental health support into diabetes care, especially for those with additional risk factors.

## Recommendations

1. Routine screening and early detection of depression in patients with Type 2DM should be implemented in diabetic clinics in PHC Centers as early identification of depressive symptoms can lead to early interventions and reducing diabetes complication and improving management outcomes through a multidisciplinary approach that addresses both physical and mental health. Collaborative care involving physicians, nurses, and diabetes educators can ensure comprehensive treatment plans.
2. Integrating lifestyle interventions such as structured exercise, dietary counseling, and Cognitive Behavioral Therapy (CBT) and programs that include lifestyle changes have shown positive effects on reducing depressive symptoms and improving glycemic control
3. Empowering patients with self-management skills and coping strategies that can improve adherence to diabetes care plans and reduce the impact of depression.
4. Train the physicians and nurses on using PHQ-9 for all diabetic patients attending the diabetic clinics.
5. Starting antidepressant use for patients with depressive symptoms with appropriate pharmacological treatments should be considered. However, the potential effects of antidepressants on blood glucose levels need to be monitored closely to avoid complications.
6. Encouraging family and community support can help reduce social isolation and provide emotional support for diabetic patients facing depression.
7. Our research recommendation for further studies is implementation of this study on a wider level. Further analysis of data is needed, as there are a number of issues that can be explored further like reviewing the correlation between the role of social and psychological support with the depressed Type 2 diabetic patients.

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# Patients' preferences for physicians' attire in Qatar. A cross-sectional study

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Received: February 2025. Accepted: February 2025; Published: April 1, 2025.

Citation: Sara Humaida et al. Patients' preferences for physicians' attire in Qatar. A cross-sectional study. World Family Medicine. April 2025; 23(2): 34-43 DOI: 10.5742/MEWFM.2025.952578549

## Abstract

**Background:** Physicians' attire is one important factor to enhance the physician-patient relationship. However, there are few studies that examine patients' preferences for physicians' attire in Qatar. This study aims to explore patients' preferences regarding their physician's attire (Business, Professional, Surgical Scrub, Casual, Qatari).

**Method:** A total of 800 participants were included in this study; 400 subjects from Hamad Medical Corporation (HMC) and 400 from Primary Health Care Corporation (PHCC).

Hamad Medical Corporation and Primary Health Care are major government healthcare institutions in Qatar. Any resident in Qatar can easily access them. Participants from PHCC were divided equally across the 3 health centers. This study used observational analytical cross-sectional study design, conducted at West Bay, Al Rayan, Leabaib Health Care Centers. As PHCC is divided into three main regions, we randomized the allocated health center in regards to these regions and we randomly chose the following mentioned study areas: Al Rayan health center in the Eastern area, West Bay Health Center in the middle, Leabaib health center in the Northern area and Hamad Medical Corporation Outpatients. Participants were selected using systematic random sampling, beginning with a randomly chosen individual, followed by every other patient on the physician's list. During their waiting time before seeing the physician, patients were approached and invited to participate, with the physician remaining unaware of the patient's participation status. All procedures followed the guide

lines outlined in the research information sheet. The interviewer introduced themselves, providing their name and specialty, explained the study's title and objectives, and requested that potential participants present their health card to verify age, confirm any history of mental illness, and specify their preferred language (Arabic or English). Verbal consent was obtained from all participants.

**Results:** A cross-sectional study was conducted using 800 patients enrolled, 461 (57.6%) of respondents were females. Age of subjects ranged from 18 to 65 years old. The majority of the respondents were non-Qatari (n=386, 48.3%). Most of the respondents preferred professional attire for physicians (n=541, 67.6%) and the majority preferred a female doctor slightly higher than male (n=362, 45.3% and n=325, 40.6% respectively). The most preferred attire for both family female and family male doctors was professional attire with white coat (n=507, 63.4% for female doctor attire and n=516, 64.5% for male doctor attire).

**Conclusions:** Patients in the PHCC and Hamad General Hospital outpatient clinics in Qatar prefer their physicians to be dressed in professional attire. Our results highlighted a view regarding physicians' attire, which can serve as a guide to improve patient's respect and enhance confidence in doctors in Qatar.

**Key words:** Physician attire, Business attire, Professional white coat attire, Surgical Scrub attire, Casual attire, Qatari attire.

## Introduction

Medical uniforms have been worn since medieval times. Physicians throughout the fifteenth and eighteenth centuries wore black 'frock' coats and 'plague costumes'. White attire became the standard as medical education became more regimented and educational institutions were founded, reflecting cleanliness. Scrubs in shades of green and blue were initially worn as uniforms in the 1970s. Today's standard medical attire has evolved to include business formal attire and a white coat. A patient's perception of a doctor during a patient care interaction may be influenced by the doctor's appearance in terms of competence, personality, and reliability(1,2).

Body language, gestures, facial expressions, and physical appearance all contribute to non-verbal communication. During an encounter, one of the first non-verbal cues that patients might assess is a physician's appearance, particularly their dress code. The way the physician dresses is becoming more essential since it might affect patients' preferences and views (1, 2, 3).

Research conducted prior to the global COVID-19 pandemic revealed that adult patients favored physicians wearing a white coat paired with a professional dress code (4,5). In a multisite study conducted in 2017 in the USA, preferences for medical wear among 4,000 adult patients were investigated. Of those polled, 53% stated it was essential to them, and the majority of this subgroup mentioned that it had an impact on their level of satisfaction with the care they received. Formal clothing with a white coat was the respondents' favoured clinical outfit (4). A 2015 review study comprising 30 qualifying publications involving over 11,000 patients found that formal attire with white coats was preferred in 60% of the research, while patient preferences for medical attire affected in 70% of the research. However, variables including physician's age, setting, location, and clinical context affected these results(6).

Patients' preferences were based on perceived danger of infection and the idea that a white coat may indicate increased sterility and cleanliness in a study involving 299 patients in Malaysia(7). A study of 443 patients in a Saudi Arabian primary care setting revealed that male patients who were married, educated, employed, and city dwellers valued physician attire, with 70% of those patients admitting that it affected the patient-physician relationship (8) However, when examining the impact of medical dress code on perceived professionalism and compassion in the palliative care context in the United States, a study involving 154 cancer patients revealed a lack of patient preference(9). Furthermore, when comparing formal, casual, and scrub suit dress, variations in patient satisfaction were not found among over 1100 patients in a study of obstetrician/gynecologist encounters (10). The impact of COVID-19 on clothing in the medical setting has drawn attention recently. Scrubs (81%, 298/368) were the

most appropriate medical apparel, according to a study done in late 2020 and published in 2021 that examined 368 patients in an outpatient setting during the height of the COVID-19 pandemic (11).

Numerous studies have demonstrated that a variety of characteristics, including the physician's sex, specialty, medical practice environment, patient's geographic location, age, and particular ailment, can affect the way that patients perceive their physician's outfit(12, 13). According to the study of Lefor et al, patients in the intensive care unit (ICU) could prefer scrubs and a white coat with a name tag (14). Psychiatric clinic patients may believe that doctors in casual attire are friendlier, while doctors with white coats are more difficult to get along with (15). Data from various research has shown that patient perceptions, such as trust, contentment, appraisal, and feedback, may have an impact on the connection between the patient and the physician (16).

There hasn't been enough focus on how Gulf Peninsula patients are affected by dress requirements for doctors. Numerous medical specialties, including surgery and medicine, as well as inpatient and outpatient settings, have conducted extensive research on the importance of medical wear and its psychological effects on patients. Traditional Saudi Arabian clothing is distinctive and is worn by both male and female physicians. For example, female physicians wear a long skirt and Abaya with black full face and head covering veil that only shows their eyes, while male physicians wear sandals, a red-white/white headscarf called a shomagh/ghutra, and a white robe called a thobe. Male doctors wear scrubs, white jackets, shirts and ties, pants or slacks, trainers or formal dress shoes, in addition to their culturally specific clothes. Female doctors may choose to wear head scarves that reveal their faces, white coats, skirts or slacks/jean, and high heel or sneakers etc. (8).

**Rationale of study:** Explore patients' preferences regarding their physician's attire (Business, Professional, Surgical Scrub, Casual, Qatari)

## Methods

A total of 800 participants were included in this study; 400 subjects from HMC and 400 from PHCC divided equally across the 3 health centers).

The study used observational analytical cross-sectional study design, conducted at West Bay, Al Rayan, LBB Health Care Centers and Hamad General Hospital OPD. As PHCC is divided in three main regions, we randomized the allocated health center in regards to these regions and we randomly chose the below mentioned study areas: Al Rayan health center in the Eastern area; West bay health center in the middle; Leabaib health center in the Northern area. HMC covers different outpatient clinics (specialties) within Hamad General Hospital.

**Study Population:** Patients registered to the pre-specified primary health care clinics and Hamad General Hospital Outpatients clinics, during the study period and who fitted our inclusion criteria.

### Inclusion criteria for the study:

1. Patients from 18 to 65 years of age who visited PHCC and Hamad Medical Corporation Outpatient clinics.
2. Patients who can communicate either in English or Arabic.
3. Stable patients.

**Exclusion criteria for the study:** Any patient younger than 18 years old and older than 65 years old.

Any patient who doesn't speak English or Arabic.

Any patient who refuses to participate.

Severe Mental illness (defined as: people with psychological problems that are debilitating so that their ability to engage in functional and occupational activities is severely impaired; Schizophrenia and bipolar disorder).

Patients who are prioritized as Emergency and urgent cases.

**Data Collection Methods:** Procedure(s) that are intrusive (such as participant logs or diaries, focus groups, interviews, or questionnaires). The poll was administered in both Arabic and English. For the English version, data was gathered using a published study called "What to Wear Today? A published study on the impact of a doctor's wardrobe on patients' trust and confidence was published in *The American Journal of Medicine* (2005) 118, 1279–1286. The validity and reliability of the survey were examined. The content validity of the questionnaire was evaluated by two researchers who are experienced in both clinical research and instrument creation. A 90% dependability was also obtained from the pilot testing. The University and the partnering Veterans Administration (VA) institutional review boards authorised the study. The Arabic language questionnaire requested back translation

by professional translator. A structured interviewer-led questionnaire was administered to each participant. This designed questionnaire was formed of four parts and a total of 18 questions as follows: Part A): Demographic (6 Questions): on Age, Gender, Nationality, Marital status, educational level, Occupation. Part B): (4 questions) family physician characteristics and Attire: included gender, language, Attire. Part C): The Attire and medical situations (8 Questions). Part D): Rating of importance of physician attire by sex in attire towards professionalism. (One Question with 4 subdivisions).

All interviewers were trained prior to the start of the study to aid, simplify and unifying the concept for all the participants.

The survey form was in English language; however, the observer could ask questions in the language convenient to the participant. The survey tool was in English and Arabic. As a backup plan the interviews were conducted in the preferred language? English or Arabic.

**Informed Consent:** Verbal consent was obtained from all research participants. There was no coercion or adverse implications for those who chose not to take part.

Patients attending the PHCC/OPD clinic were asked to fill out the questionnaires. Patient selection was randomized systematically by choosing the first participant randomly and then selecting every other encounter on the physicians' list.

Patients were approached and invited to participate during their waiting time before being seen by their physicians, who were unaware of whether the patients had completed the survey. All instructions mentioned in the research information sheet were followed.

The interviewer introduced themselves, including their name and specialty, explained the title and aim of the research, and then asked potential participants to show their health card to verify their age. Participants were also asked about any previous mental illness and their preferred language (Arabic or English only). Verbal consent was then obtained.

Each interviewer coded the questionnaire paper. The questions, including demographic details, pictures, and main survey items, were explained by the interviewer following the attached script. Participants were informed about the need to complete all questions.

Participants were given 20 minutes to complete the questionnaire privately. They were allowed to approach the interviewer for clarification if needed and were instructed to leave the completed questionnaire in the physician's office. Interviewers collected the papers at the end of the day. There was no anticipated health risk on any participants in the study.

**Primary outcome:** The preferences of physician attire as perceived by their patients as physician qualities in different clinical situations (emergency, private discussions, and minor clinical presentations).

**Secondary outcome:** The insight of patient satisfaction with the care provided in domains of (trust, competency, authority, care and compassion) in relation to their physician's outfit (i.e on scrubs, lab coat, casual, professional suit, local Qatari thoub or Abaya).

**Ethical Consideration:** The study was conducted after review and approval of MRC-01-20-1044 and in full compliance with Principles of Declaration, Good Clinical Practice and Laws and regulations of Ministry of Health in Qatar.

**Figure 1: Survey photographs of model male and female physicians in various attire**



## Results

Table 1: Sociodemographic characteristics of the studied participants (N= 800)

Variables	Classification	Frequency	Percentage
<b>Age</b>	18- 25	111	13.9
	26- 40	421	52.6
	41- 65	238	29.8
	≥65	29	3.6
<b>Gender</b>	Male	339	42.4
	Female	461	57.6
<b>Nationality</b>	Qatari	278	34.8
	Non-Qatari	386	48.3
	Non- Qatari Arab	136	17
<b>Marital status</b>	Single	159	19.9
	Married	593	74.1
	Widow/divorced	47	5.9
	Missed	1	0.1
<b>Education</b>	Post Graduate	133	16.6
	Grade	351	43.9
	Secondary	243	30.4
	Primary	47	5.9
	Illiterate	24	3
	Missed	2	0.3
<b>Employment</b>	Student	89	11.1
	Manual	162	20.3
	Professional	267	33.4
	Clerical	174	21.8
	Retired	102	12.8
	Missed	6	0.8

Table 2: Family Physician characteristics and their Attire preferred by participants

Question	Variable	Frequency	Percentage
Which physician characteristic is most important to you?	Age	120	15
	Gender	92	11.5
	Language	318	39.8
	Race	30	3.8
	Other	240	30
Which would you prefer to be your family doctor?	Male	325	40.6
	Female	362	45.3
	Not important	112	14
Which would you prefer to be your female family doctor?	Business	164	20.5
	Professional	507	63.4
	Surgical scrub	40	5
	Casual	31	3.9
	Qatari	55	6.9
Which would you prefer to be your male family doctor?	Business	143	17.9
	Professional	516	64.5
	Surgical scrub	52	6.5
	Casual	39	4.9
	Qatari	36	4.5

The majority of participants (n = 318, 39.8%) identified language as the most important characteristic of a physician, while race was considered the least important (n = 30, 3.8%). In terms of physician gender preference, slightly more participants preferred female doctors (n = 362, 45.3%) compared to male doctors (n = 325, 40.6%). When it came to physician attire, the most preferred attire for both female and male family doctors was professional clothing, with 63.4% (n = 507) favoring professional attire for female doctors and 64.5% (n = 516) for male doctors. The least preferred attire for female family doctors was casual wear (n = 31, 3.9%), while for male family doctors, it was Qatari traditional dress (n = 36, 4.5%).

**Table 3: What attire would you prefer a physician to wear in different medical situations**

Question	Variable	Frequency	Percentage
<b>Which physician attire would you prefer for an emergency situation, eg. (heart attack)?</b>	Business	114	14.2
	Professional	424	53
	Surgical scrub	180	22.5
	Casual	56	7
	Qatari	23	2.9
<b>Which would you prefer to discuss intimate social and sexual problems with?</b>	Business	136	17
	Professional	486	60.8
	Surgical scrub	59	7.4
	Casual	55	6.9
	Qatari	48	6
<b>Which would you prefer to discuss psychological problems with?</b>	Business	162	20.3
	Professional	464	58
	Surgical scrub	49	6.1
	Casual	59	7.4
	Qatari	57	7.1
<b>Which would you prefer for minor medical problems, eg common cold?</b>	Business	122	15.3
	Professional	477	59.6
	Surgical scrub	78	9.8
	Casual	90	11.3
	Qatari	24	3

The majority of participants preferred professional attire for medical situations. The least preferred attire for emergencies, intimate consultations, and minor medical issues was Qatari attire, while for psychological consultations, surgical scrubs were the least favored.



**Table 4: Rating the Importance of Physician Attire in Relation to Professionalism, Based on Gender :**  
(as Shown in Figure 1)

<b>Question</b>	<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Which of these doctors would you trust the most?</b>	Business	129	16.1
	Professional	541	67.6
	Surgical scrub	44	5.5
	Casual	27	3.4
	Qatari	46	5.8
<b>Which of those would you deem to be more Knowledgeable and competent?</b>	Business	139	17.4
	Professional	536	67
	Surgical scrub	47	5.9
	Casual	23	2.9
	Qatari	37	4.6
<b>Which of these doctors have the most caring and compassionate demeanour?</b>	Business	119	14.9
	Professional	487	60.9
	Surgical scrub	71	8.9
	Casual	43	5.4
	Qatari	62	7.8
<b>Which of these doctors would be more authoritative and in control?</b>	Business	156	19.5
	Professional	469	58.6
	Surgical scrub	34	4.3
	Casual	24	3
	Qatari	97	12.1

The attire most preferred by participants for professionalism was professional attire, while casual wear was the least favored option for professional settings.

## Discussion

The patient-physician interaction is fundamental to the practice of medicine. Doctors strive to establish a rapport right from the start in order to create a partnership and deliver patient-centered care, which is characterized as being “respectful of, and responsive to, individual patient preferences, needs, and values.” It should come as no surprise that curricula in medical schools frequently contain courses focused on enhancing patient experiences.

This study included 800 patients receiving medical care in the pre-specified primary health care clinics and Hamad General Hospital outpatient clinics to report preferences regarding physician attire in Qatar. The majority of the participants’ chose language as the most important physician characteristic, while the least character was race, and the majority preferred female doctors slightly higher than males.

The preferences of respondents may vary depending on their location for a number of reasons. For instance, in the UK, patients’ opinions of their doctor’s clothing may be significantly impacted by the “bare below the elbows” guideline (17). Patients’ tastes may also be influenced by their geographic location for cultural or even climate-related factors. Since our study was carried out in Qatar’s PHCC and Hamad General Hospital outpatient clinics, it might not be applicable to people everywhere. Previous research has shown that younger patients prefer more informal clothing than older patients, who adhere to a more formal dress code (18,19).

Physician attire represents only a minor portion of the medical profession; it does not define the person or inherently impact their performance, practice, or accomplishments. But as medical dress changes, the medical community should be aware of any possible connections between medical attire and the profession’s main goal of delivering high-quality patient care. The incorporation of informal medical apparel into routine practice ought to prioritise fostering positive patient relationships, mitigating the danger of nosocomial pathogen transmission, and effectively explaining the role of physicians in patient care. While introducing themselves to patients and other team members, all doctors regardless of their attire, should make clear what their tasks are. In contrast to doctors in a white coat, doctors in casual wear should be aware of the impression they may give patients. They can try to counteract this by developing a connection with patients through other means. Nonetheless, the launch of new medical apparel offers a revolutionary chance to address enduring gender prejudices in the field (1).

According to the current study, professional attire was preferred by both family male and female doctors (64.5% for male doctors and 63.4% for female doctors). Casual clothing was the least popular choice for family female doctors (3.9%), while Qatari doctors (4.5%) had the least preferred outfit. Numerous investigations examining patients’ opinions of medical wear have produced a

wide range of results, many of which are contradictory and complicated by the use of several metrics and end points. Numerous research conducted on different continents have revealed a distinct patient preference for white coats, which is in line with our findings (20,21). However, some studies reveal no significant preferences, (22, 23) and others indicate that the white coat may even cause higher levels of anxiety in patients (24).

Comparable to this study, a cross-sectional study carried out in primary care clinics in Riyadh, Saudi Arabia, discovered that more than 80% of patients preferred seeing their doctor in a white coat, while 47% of participants opposed traditional Saudi clothing(8). Patients who were married, educated, or working men placed a larger value on a doctor’s attire. Seventy percent of patients thought that wearing a doctor’s coat improved the doctor-patient interaction (25). Additionally, a survey carried out at the outpatient clinics of King Abdulaziz Medical City (Hospital), Riyadh, Saudi Arabia, discovered that the majority of patients (62%) favoured the formal attire of physicians, which was described as a tie, shirt and pants. Just 9.7% of the patients said they favoured Saudi national attire. The majority of patients (73%) said that female doctors should wear long skirts. Up to 85% of patients said that doctors should wear the white coat (26).

This phenomena may be caused by the widespread belief that physicians in white coats are more professional and knowledgeable, which gives patients greater assurance and trust when they visit with them (27, 28). In addition, some patients believe that the white coat is a part of their culture, traditional values, and society expectations, and it makes authority easier to identify (29).

## Conclusion

In brief, we discovered that the majority of adult primary care patients felt that wearing medical apparel was significant. Professional clothes with symbolic meaning were highly valued by the study’s participants. Beneficial clothing choices for doctors have a beneficial impact on how the patient perceives their professionalism, competence, and trustworthiness. We were able to group different sorts of doctor attire into fewer themes, which could aid in the creation of policies and make it easier for doctors to choose outfit combinations. Healthcare systems should take the context of treatment into account when developing dress code regulations.

### Acknowledgement

One student participated in the data collection, Mussab Islam Hussein, Affiliation: Omer Secondary School

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