Ministry of Health of Ukraine

Bogomolets National Medical University

Pharmaceutical Faculty

Department of Clinical Pharmacology and Clinical Pharmacy

Kyiv, Ukraine

Graduate Master’s Thesis

Topic:

**Pharmaceutical Care in the Use of Escitalopram**

**in Anxiety Disorders**

Created by: student of Higher Education, 5th year, Group 9601pha

Weam Taha

Head – Doctor of Medical Science, Professor Khaitovych M.V.

Supervisor – Doctor of Medical Science, Professor Khaitovych M.V.

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**Abbreviations**

DSM-5 - Diagnostic and Statistical Manual of Mental Disorders 5th ed

GAD - Generalized Anxiety Disorder

SAD - Social Anxiety Disorder

PD - Panic Disorder

PTSD - Posttraumatic stress disorder

OCD - Obsessive-compulsive disorder

CBT - Cognitive-behavioral therapy

5-HT - 5-hydroxytryptamine

RCT - Randomized controlled trials

EST - Empirically supported treatment

CVD – Cardiovascular disease

CHD – Coronary Heart Disease

ACS - Acute Coronary Syndrome

HADS - Hospital Anxiety and Depression Scale

HADS-A – Hospital Anxiety Subscale

MACE – Major adverse cardiovascular events

TDM -Therapeutic drug monitoring

SCD - Sudden Cardiac Death

**Introduction**

**Actuality:** As one of the most common psychiatric disorders, Anxiety more commonly occurs with other disorders rather than existing in isolation [1,12]. Early intervention is very effective in preventing cognitive, physiological, and behavioral symptoms and preventing the development of more serious mental health conditions [1, 10]. According to the DSM-5, it is divided into several types; the most frequently faced by healthcare professionals are Generalized Anxiety Disorders (GAD), Social Anxiety Disorders (SAD), and Phobic Disorders (PD) (1). GAD causes excessive, unrealistic, and ongoing concern about commonplace issues (such as money, family, health, and the future), accompanied by fear, worries, and a continual sense of being overwhelmed [4]. SAD, which is also known as social phobia, is marked by an overwhelming fear of rejection, humiliation, or embarrassment when participating in a public performance or social engagement and being subject to potential unfavorable criticism from others [5]. However, PD is accompanied by frequent, unpredictable panic attacks [6]. There is evidence that both SAD and GAD have significant rates of recurrence and/or chronic anxiety symptoms; there are several reasons why this refractory nature may exist, such as substance abuse, inadequate treatment adherence, misdiagnosis, or other comorbidities [13]. For the treatment of PD, GAD, and SAD, the Food and Drug Administration (FDA) has approved several selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs). Notwithstanding these labels, drugs not approved for a particular ailment are commonly used "off-label" in clinical practice. Like the FDA, the European Union has expanded indications for the use of SSRIs and SNRIs to treat anxiety disorders. As SSRIs have more efficacy and less cardiotoxicity than many first-generation antidepressants, they became the first-line treatment for GAD, SAD, and PD [13]. When considering both combined effectiveness and tolerability, Escitalopram comes first. It’s more efficacious when compared to a placebo, and there is evidence that it works better than several antidepressants. The FDA approves Escitalopram to treat GAD with 10 mg/d as an initial dosage to 20 mg/d maximum, and it is widely prescribed off-label for PD, SAD, and a variety of other psychiatric conditions [2]. Based on its interaction with orthosteric and allosteric binding sites at the serotonin transporter, nonclinical studies have provided potential approaches by which Escitalopram could be more efficacious [3]. Pharmacists are responsible for optimizing dosages to mitigate the occurrence of manageable side effects associated with Escitalopram, including insomnia, nausea, increased sweating, fatigue, drowsiness, vomiting, and sexual dysfunction. Additionally, they ensure the avoidance of potentially harmful side effects such as bleeding, serotonin syndrome, and QT-prolongation [2]. They play a crucial role in patient education, enabling them to make well-informed treatment choices and actively participate in their healthcare. Coordinated communication between the healthcare team has a significant role in achieving the best possible outcome for the patient, preventing drug interactions, and mitigating the risk of adverse events, resulting in more effective therapeutic outcomes and a better life quality for patients suffering from anxiety.

**The purpose of the research:**

The work aims to quantify the benefits of clinical evaluation and comprehensive pharmaceutical care in using escitalopram and to optimize the pharmaceutical care of patients with cardiovascular disease and anxiety disorders taking escitalopram, including medication management, patient education, and adherence support, to improve their quality of life.

**Tasks:**

- To determine the frequency of use and the age of patients who are taking escitalopram

- To establish the awareness of pharmacists of escitalopram side effects

- To determine the awareness of pharmacists and patients of escitalopram drug interaction risks

- Emphasize the role that pharmacists play in improving patient outcomes and managing the use of escitalopram in a variety of therapeutic settings.

- seeks to identify, assess, and refine the multifaceted roles of pharmaceutical care in maximizing the drug's clinical efficacy and safety.

**The object of the study:**

Pharmaceutical care in the use of Escitalopram in anxiety disorders.

**The subject of the study:**

This research will assess the effectiveness of Escitalopram in providing the best outcomes for the well-being of patients.

**Research materials and method:**

Data from global websites, analytical reports, and clinical studies on the efficacy of escitalopram in treating anxiety disorders will all be incorporated into this work.

**Methods:** analytical and statistical.

**Expected scientific innovation:**

This research will identify the optimal use of Escitalopram by deep dive into the knowledge of its optimal use.

**Practical significance of the obtained results.**

The gathered research findings will support pharmaceutical care to make more sensible decisions about the use of Escitalopram in anxiety disorder and lead to better outcomes by providing practical methods to improve patients' quality of life.

**SECTION 1**

**LITERATURE REVIEW**

* 1. **Overview of anxiety disorder.**
		1. **Anxiety disorder**

It is the prevailing mental disorder, with a higher prevalence in females compared to males, with a ratio of approximately 2:1, and associated with high morbidity and increased risk of suicide [1]. Mounting research suggests that age significantly influences the development of mental diseases [16]. Adolescence is when it initially manifests; if it’s not treated, it can continue into adulthood with greater severity. [10, 29]. Regarding specific anxiety disorders, older individuals exhibited significantly reduced rates of both current and lifetime anxiety disorders [17]. It entails malfunctioning in brain circuitry that reacts to threats, and the main characteristics consist of an overwhelming sense of fear and anxiety and the avoidance of imagined dangers that are persistent and have a negative impact on daily functioning [29]. Anxiety disorders are capable of existing alone but frequently co-occur with one other and with other mental disorders, particularly depression, as well as with somatic disorders [12, 29]. Furthermore, it has been linked to an impoverished prognosis in those suffering from depression. Therefore, the American Heart Association recommends assessing persons who receive a positive diagnosis of depression for the presence of anxiety as well since high mortality rates are linked to adverse cardiac events. [1, 26].

* + 1. **Etiology, symptoms, and types:**

Anxiety disorders are muti-factorial caused by a combination of biopsychosocial factors, genetic or epigenetic interactions, environmental influences, trauma, childhood experiences, medications, herbal medications, and substance abuse [1, 9, 29]. Norepinephrine, serotonin, dopamine, and gamma-aminobutyric acid (GABA) are believed to be the primary regulators of anxiety in the central nervous system. The autonomic nervous system primarily regulates most symptoms, particularly the sympathetic nervous system [1]. Anxiety arises when a stimulus that was formerly neutral becomes associated with a negative stimulus through classical conditioning. Therefore, a relatively neutral stimulus produces a conditioned fear response linked to the initial unpleasant stimulus, resulting in the experience of anxiety and suffering [9]. Furthermore, given that the amygdala has a significant role in alleviating anxiety and fear, individuals with anxiety disorders exhibit heightened amygdala responses to anxiety stimuli [1].

Anxiety symptoms are typically categorized into cognitive, physiological, and behavioral manifestations [1]. The fear-learning mechanism is crucial in acquiring and maintaining symptoms [9]. The symptoms of this condition are also linked to reduced work productivity, higher utilization of medical resources, decreased overall satisfaction, and poor physical and social abilities. Additionally, it is strongly connected with several chronic illnesses, particularly cardiovascular disease [18].

Anxiety disorders are divided into acute and chronic. The DSM-5 categorizes it as follows:

1. Separation Anxiety Disorder,
2. Social Anxiety Disorder,
3. Generalized Anxiety Disorder,
4. Panic Disorder,
5. Selective Mutism,
6. Specific Phobia,
7. Agoraphobia,
8. Substance/Medication-Induced Anxiety Disorder,
9. Anxiety Disorder Due to Other Medical Conditions. [1]

Three of them are being treated with escitalopram as an approved drug or off-label:

1. Generalized Anxiety Disorder (GAD):

It is a prevalent and most common psychiatric condition faced by clinicians; however, there is a scarcity of data to guide effective and safe treatment. It causes fear, concern, and a continuous sense of being overwhelmed. It is marked by ongoing, excessive, overwhelming concern and unrealistic worry about everyday matters, such as finances, family, health, and the future, linked to heightened stress. It is characterized by an excessive nature, challenging to manage, and frequently accompanied by numerous non-specific psychological and physical symptoms [4, 12,15].

1. Social Anxiety Disorder (SAD):

This is referred to as social phobia, and it is typified by an overwhelming dread of embarrassment, humiliation, or rejection when exposed to potential negative appraisal by others, whether participating in a public performance or social engagement [5].

1. Panic Disorder (PD):

A notable observation in individuals with panic disorder is the presence of bodily fear and anxiety rather than cognitive manifestations. Although frequent, unplanned panic attacks are a feature of panic disorder, and both are prevalent issues frequently encountered in the field of psychiatry, the two conditions are not the same. Panic attacks can happen often, with many daily occurrences, or infrequently, with only a few incidents yearly. These assaults are the distinctive characteristic of PD and might happen unexpectedly [6].

* + 1. **Treatment approaches**

Both evidence-based psychotherapy, including cognitive behavioral therapy, and psychoactive drugs, notably serotonergic substances, are beneficial in helping patients make therapeutic decisions [29]. Benzodiazepine – a first-generation antidepressant, is widely recognized for its effectiveness in treating acute anxiety, but psychotherapy, pharmacotherapy, or a combination of both are commonly employed for chronic instances [1].

Pharmacotherapy:

1. Selective serotonin reuptake inhibitors (SSRIs) are the preferred initial treatment for anxiety due to their lower cardiotoxicity compared to most first-generation antidepressants. Additionally, they have a reduced incidence of hazardous side effects in comparison to their predecessors, monoamine oxidase inhibitors and tricyclic antidepressants. However, evidence shows they inhibit sodium, calcium, and potassium ion channels at concentrations near therapeutic levels. They act by enhancing the effect of serotonin [1, 11].
2. Serotonin-norepinephrine reuptake inhibitors (SNRIs) - are likewise regarded as the initial therapeutic option in anxiety, particularly GAD [1].
3. Benzodiazepines – their rapid action qualifies them as short-term management in anxiety and makes them efficacious for panic attacks [1].
4. Tricyclic antidepressants – second-line treatment since they have a higher likelihood of causing more severe adverse effects due to their anticholinergic activity and reduced threshold for overdose [1, 30].
5. Mild tranquilizers – they are less likely to cause drowsiness and addiction and have minor withdrawal symptoms, such as buspirone for GAD [1].
6. Beta-blockers – they are commonly prescribed to treat anxiety and manage its physical manifestations, which might be beneficial for individuals with social phobia [1, 31].

Psychotherapy:

It is divided into cognitive behavioral therapy (CBT), behavioral therapy (BA), interpersonal therapy (IPT), and exposure therapy [1, 10].

1. Cognitive-behavioral therapy:

CBT is a systematic, instructional, and purpose-driven therapy founded on a clear and logical understanding of how cognition, thoughts, feelings, and behavior are interconnected. It has demonstrated effectiveness in treating anxiety conditions. Furthermore, research has shown that CBT offers supplementary advantages or comparable results when compared to medicine as a standalone treatment. [7, 9].

Three aspects of cognition are emphasized:

¬ Automatic thoughts,

¬ Cognitive distortions,

¬ Underlying beliefs or schemas. [7]

This therapeutic method is characterized by active participation and practical application. The therapist and patient work together to adjust cognitive and behavioral patterns to positively transform the patient's mood and lifestyle [7].

1. Exposure therapy:

It involves systematically and repeatedly exposing patients to specific situations or internal triggers, either through imagination or in real life, to provoke anxiety and cause obsessive behaviors or avoidance. During these exposures, patients are taught to refrain from participating in compulsive behaviors and avoidance and instead learn to adapt to the discomfort and distress that come with them. Therefore, extinguishing the negative reinforcement model weakens the connections between previously learned fear and concerning outcomes [9].

Although RCTs have shown that exposure-based therapies are effective in treating anxiety disorders in adults and are considered empirically supported treatments (ESTs), as well as Extensive empirical evidence supports the effectiveness of exposure therapy in treating phobia, SAD, GAD, PD, OCD, and PTSD, as stated in international guidelines, a significant number of both young people and adults do not respond well to these therapies. Although empirical data supports its effectiveness, there is still a considerable disparity between theory and practice, resulting in the underutilization of exposure-based therapies in clinical settings. This can be due to difficulties engaging in exposure exercises, a perceived lack of immediate therapeutic benefits, or the treatment burden. Additionally, the limited availability of trained providers who offer exposure-based therapies can result in long waiting periods for treatment, making it challenging for many patients to access this type of treatment [8, 9].

* 1. **Escitalopram and its role in treatment.**
		1. **Escitalopram**

The (S)-enantiomer of citalopram is a potent selective serotonin reuptake inhibitor [2]. Due to its allosteric features, it’s categorized as an allosteric serotonin reuptake inhibitor and exhibits greater efficacy compared to placebo and various other antidepressants [3]. Clinical practice guidelines advocate using second-generation antidepressants, specifically SSRIs, as the initial therapy option [14]. It has been demonstrated that antidepressants like escitalopram can reduce the reactions of the limbic regions of the brain to elementary unpleasant visual stimuli while simultaneously enhancing the responses to elementary delighted stimuli that are visual [42]. It’s one of the most often prescribed newer antidepressants (ADs) globally [43]. Based on 2020 data, escitalopram has the 15th position among the most frequently prescribed medications in the United States [19]. The FDA has approved using it in adults and children aged seven and above to treat Generalized GAD. Additionally, it has been used off-label for SAD and PD [2]. Research has demonstrated its effectiveness in diminishing anxiety and depression among the general populace [18]. However, it has not been officially evaluated in individuals with ACS [26].

* + 1. **Mechanism of action**

SSRIs function by attaching to the sodium-dependent serotonin transporter protein (SERT) found in presynaptic neurons. SERT reabsorbs serotonin from the synaptic cleft into the presynaptic neuron. Escitalopram deactivates SERT, elevating serotonin levels in the synapse [2]. And with its enhanced selectivity, it offers a refinement in SSRI therapy for anxiety disorders [40].

* + 1. **Pharmacokinetics and administration**

Escitalopram is a linear, dose-proportional drug with a linearity of 10-20 mg/d, not affected by food. It is metabolized in the liver by enzymes CYP3A4 and CYP2C19, yielding S-di-desmethyl (S-DDCT) and S-desmethyl-citalopram (S-DCT) with a terminal half-life of 27-33 hours. The urinary system eliminates the substance and its byproducts [2, 21].

Escitalopram is used orally in two forms: tablets containing 5 mg, 10 mg, or 20 mg and an oral solution containing 1 mg/mL; it is crucial to commence with a small dosage and gradually escalate it [2, 22]. For GAD, the starting dose is 10 mg/d, and the maximum advised dose is 10 mg/d [2].

* + 1. **Adverse effects**

The commonly reported side effects include nausea, vomiting, tiredness, excessive perspiration, insomnia, drowsiness, abdominal pain, weight gain, sexual dysfunction, and paradoxical anxiety that reduces over time. Serotonin syndrome, bleeding, and QT prolongation are infrequent but potentially severe side effects, in addition to the possibility of causing hyponatremia in older patients [2, 22, 28].

Multiple studies examining the impact of selective serotonin reuptake inhibitors (SSRIs) on cognitive function have observed alterations in learning and reinforcement outcomes when delivered to healthy volunteers, either in the short term or over a prolonged period [41].

* 1. **Understanding cardiovascular diseases and anxiety disorders.**
		1. **The relationship between cardiovascular diseases and anxiety disorders**

Atherosclerotic cardiovascular disease encompasses several conditions, including coronary heart disease, ischemic heart disease, myocardial infarction, sudden cardiac death, cardiovascular mortality, stroke, and peripheral arterial disease, or it might involve any combination of these endpoints [23]. CHD usually occurs when an atheromatous plaque in an epicardial coronary artery ruptures or erosion. This plaque rupture triggers the formation of blood clots in the artery, resulting in an ACS, which can manifest as a myocardial infarction (MI), unstable angina, or sudden cardiac death [22]. Some researchers have contended that psychological factors (e.g., anxiety) carry equal significance to traditional risk factors in CVD and may result in more unfavorable outcomes for those with preexisting conditions [23, 24, 25]. Research indicates a correlation between anxiety and a higher likelihood of developing diabetes, obesity, dyslipidemia, and hypertension, all of which are risk factors for CVD. However, certain research proposes a contrary correlation, indicating that the development of anxiety may elevate the risk of CVD. The physiologic effects of anxiety, such as increased levels of inflammatory biomarkers and cytokines, can also independently raise the risk of CVD [24].

Psychological stress has been widely believed to have the potential to affect physical health, specifically in relation to CVD. Providers may witness patients with mental health issues, such as anxiety, experiencing the onset of CVD at earlier stages of life, or facing more difficult clinical progressions. These patients may face challenges in following their prescribed medication and lifestyle advice, resulting in more rapid disease progression and more prone to participate in activities, such as tobacco or substance consumption, which may elevate the risk of CVD [24].

Anxiety has been linked to the development of cardiovascular disease, and patients with CVD often experience anxiety as a comorbidity and have more occurrences of it, which is related to a more unfavorable prognosis and higher mortality rates. Nevertheless, the efficacy of anxiety treatment in patients with CHD remains questionable [1, 18, 23, 27]. Anxiety is common among those with cardiac conditions, with estimates varying between 25% to 44%. Over 40% of post-myocardial infarction patients have elevated anxiety symptoms, and that anxiety is linked to a 50% higher risk of serious adverse cardiac events [20]. Moreover, there have been publications suggesting a correlation between anxiety and unfavorable outcomes in individuals with cardiovascular disorders. Anxiety is also linked to the development and advancement of cardiac disease, as well as adverse cardiovascular outcomes, such as mortality [19]. Based on a recent meta-analysis, it was found that anxiety is linked to a 26% higher chance of developing coronary heart disease (CHD) and a 48% higher chance of experiencing cardiac mortality [23]. Patients who experience elevated levels of anxiety are at a heightened risk for SCD. During an acute anxiety attack, hyperventilation can cause coronary artery spasm, which can finally result in myocardial ischemia and deadly ventricular arrhythmias [32].

Furthermore, prior research on patients with ACS revealed a strong association between anxiety and depression and their impact on adverse cardiac outcomes. Nevertheless, there is a scarcity of studies examining the therapeutic effect of anxiety in individuals with ACS. This contrasts with the numerous research that have examined the outcomes of people with acute coronary syndrome (ACS) and depression [26].

* + 1. **Efficacy and safety of Escitalopram in cardiovascular diseases and anxiety disorders**

Selective serotonin reuptake inhibitors (SSRIs) remain the primary choice for treating anxiety in patients with cardiovascular disease and the recommended choice of medication since they are less cardiotoxic, have few adverse reactions, and can be safely used in combination with cardiac medicines, particularly in cases with chronic stable heart failure [22, 25]. Escitalopram demonstrates both safety and efficacy in treating anxiety among individuals with stable CHD and ACS who experience anxiety [20, 26].

Although anxiety is common and has a detrimental effect on patients with ACS, there is currently a lack of evidence-based treatments for anxiety in this population. However, a 24-week randomized placebo-controlled trial demonstrated that treatment with escitalopram resulted in a faster resolution of anxiety symptoms compared to placebo in ACS patients. This suggests that escitalopram can be considered an effective and safe treatment option for anxiety in ACS patients, as it significantly reduces anxiety symptoms without any difference in safety compared to a placebo. It is essential to mention that the purpose of this trial was originally to address depression as the primary focus. Nevertheless, anxiety commonly coexists with depression in both the general population and individuals with ACS, and the results confirm the impact of escitalopram on both conditions [26]. A subsequent study investigated the efficacy of a 24-week treatment with escitalopram in preventing depression in nondepressed patients with ACS. The study demonstrated that escitalopram not only significantly reduced anxiety, depression, and adverse effects but also produced clinically significant improvements when compared to the use of placebo controls [18]. Another study's findings indicate that escitalopram may effectively reduce anxiety symptoms in patients with cardiovascular diseases without increasing the risk of all-cause mortality or acute coronary syndrome (ACS). The findings suggest that escitalopram does not raise the risk of MACE or QT prolongation in patients with cardiovascular diseases [19]. Prior research has demonstrated a direct correlation between anxiety and the release of urinary catecholamines. Since escitalopram reduces it, it implies a beneficial impact on the physiological manifestations of anxiety, which are known to contribute to the onset and worsening of cardiovascular disease [18].

While there are suggestions that exercise may have positive effects on the treatment of anxiety disorders, an UNWIND randomized clinical trial demonstrated that escitalopram was more effective than exercise training or a placebo in lowering anxiety levels in anxious patients with CHD. The positive impacts remained for six months after the treatment. While engaging in moderate or strenuous physical activity offers various health advantages, it does not seem to be an efficient remedy for anxiety in individuals with CHD [18, 20, 27]. On the HADS-A, which was used to assess anxiety symptoms in ACS patients (with a HADS-A score greater than 7 indicating the presence of an anxiety disorder), the exercise intervention did not lead to a decrease in anxiety levels when compared to the placebo treatment [18, 26].

* + 1. **Challenges of using escitalopram**

Psychotropic medications can cause cardiovascular consequences. Conversely, cardiac medications can also have psychological consequences [25]. While escitalopram is generally considered safe and doesn’t considerably raise the probability of cardiovascular adverse reactions in patients with underlying cardiovascular disease, there are worries about its potential to cause adverse cardiovascular reactions, particularly QT interval prolongation and the risk of torsade de pointes [19]. Patients who are taking pro-arrhythmic drugs, have a genetic predisposition for acquired long-QT syndrome, are over 65 years old, or have a predisposition to arrhythmias should undergo therapeutic drug monitoring (TDM), where the serum concentrations of escitalopram should be maintained below 100 nM to prevent exposure to potentially harmful levels of escitalopram that could harm the heart, hence avoid any changes that could lead to arrhythmias [21]. TDM should be employed to mitigate the risk of patients over the age of 65 to prevent potentially dangerous levels of escitalopram that could adversely affect the heart. As individuals age, their ability to eliminate drugs from their system decreases, leading to an increased probability of reaching a threshold that poses a risk of developing arrhythmias [21]. For instance, the concurrent use of escitalopram with metoprolol may lead to an elevation in beta-blocker levels, necessitating a decrease in beta-blocker dosage and heart rate monitoring [25]. Escitalopram overdose can lead to QT prolongation and potentially fatal TdP arrhythmia. To manage this, a single dose of activated charcoal is recommended for patients ingesting at least 300 mg of escitalopram, and cardiac monitoring is recommended [2].

* 1. **Optimization of pharmaceutical care.**
		1. **Drug interactions and contraindications**

Drug-drug interactions involve modifying a drug's pharmacodynamic or pharmacokinetic characteristics by adding another drug, potentially leading to adverse reactions or changes in benefits. Most kinetic drug-drug interactions involve CYP enzymes, and any medication that inhibits or blocks CYP activity can alter the metabolism of the added drug therapy, potentially attenuating or potentiating its effects [25].

Escitalopram hinders platelet activity, which raises the likelihood of bleeding when taken with antiplatelet medications (such as heparin). This risk is further heightened when escitalopram is also used with NSAIDs. To minimize the risk of serotonin syndrome, it is recommended to refrain from concurrent use of escitalopram and rasagiline. Avoid medicines that extend QT intervals, such as amiodarone, especially in individuals with chronic kidney disease [2].

Cannabidiol (CBD) and tetrahydrocannabinol (THC) both could strongly inhibit cytochrome enzymes and interact with SSRIs, leading to increased levels of SSRIs in the bloodstream. Furthermore, the occurrence of drug-drug interactions, including those involving illicit substances like cannabis or cannabidiol (CBD), is significant among numerous teenagers due to the growing prevalence of these substances. Hence, the simultaneous use of CBD and CYP2C19-metabolized SSRIs (escitalopram in our case) elevated the likelihood of specific adverse effects associated with SSRIs, possibly due to changes in the levels of SSRIs in the body [28].

The combination of escitalopram and an MAOI is strongly discouraged due to the potential for inducing serotonin syndrome [2].

* + 1. **Monitoring and managing side effects**

Transitioning from an SSRI to escitalopram requires a recommended 4-week dose reduction, requiring personalized dosing based on anxiety severity, treatment response, and comorbidities, ensuring the appropriate dosage adjustment is made, and A 4-week tapering phase is advised before embarking on another course of antidepressant treatment to decrease the potential for serotonin syndrome. Furthermore, medications that hinder the process of serotonin metabolism are also not recommended [2].

Selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) are linked to both early-onset (often temporary) and late-onset adverse effects in young individuals. Pharmacokinetic techniques can help manage adverse effects and guide options for discontinuing SSRI/SNRI medications [28]. Withdrawal symptoms associated with selective serotonin reuptake inhibitors (SSRIs) have been documented for many years and typically occur when antidepressant medications are suddenly stopped. Nevertheless, withdrawal symptoms might be observed when doses are missing or when considerable dose changes are implemented in certain patients. The withdrawal of antidepressants has been assessed from both the perspectives of pharmacokinetics and pharmacodynamics. Typically, antidepressant withdrawal has examined chiefly the pharmacodynamic elements related to the 5-HT transporter, also known as SERT. Pharmacokinetic factors play a crucial role in SSRI discontinuation, as they may subtend the risk of withdrawal symptoms in youth, despite the lack of comprehensive understanding of these risk factors in pediatric patients compared to adults [28].

It is essential to consider the potential danger of QTc prolongation when using escitalopram to treat anxiety in individuals with ACS because there is a direct correlation between the prolonging of QTc and the dosage. Furthermore, escitalopram has the potential to worsen sinus bradycardia and atrioventricular (AV) block by blocking sodium and calcium channels [2, 26]. Thus, patients having a history of arrhythmias should undergo follow-up electrocardiograms (ECGs) once therapeutic levels of escitalopram have been achieved. These electrocardiograms (ECGs) are essential for evaluating the elongation of the QT interval. This is especially vital for patients who are 65 years of age or older or those who have a familial predisposition to arrhythmias [2,18]. Escitalopram overdose-induced agitation can be effectively treated with benzodiazepines, whereas severe cases of serotonin toxicity may necessitate the use of endotracheal intubation and ventilatory support [2].

* + 1. **Patient assessment and counseling:**

To ensure the safe and efficient use of escitalopram, it is essential to know its possible adverse effects and interactions with other drugs. It is crucial to delineate the clinical uses, mechanisms of action, potential adverse effects, and drug interactions of escitalopram to assist interprofessional healthcare practitioners in guiding patient therapy for treating different illnesses. This statement underscores the significance of careful and attentive monitoring by healthcare providers during escitalopram medication. It highlights the need for educated decision-making to enable early diagnosis and intervention, ensuring patient safety and delivering the best possible care [44].

Early intervention helps reduce the progression of symptoms and the development of more serious mental health issues later in life [10]. Nevertheless, assessing symptoms before starting pharmacotherapy is crucial due to early-emerging side effects [28]. Anxiety comorbidity with other mental disorders typically indicates more intense symptoms, a higher level of clinical impact, and increased challenges in therapy [29]. An interprofessional team is essential for addressing anxiety, and pharmacists play a crucial role in providing patients with comprehensive information about drugs, monitoring drug concentrations in the blood, and assessing serum electrolyte levels to detect abnormalities. A pharmacist also plays an essential role in minimizing drug-drug interactions with SSRIs and ensuring that patients are not taking additional medications that could result in polypharmacy. In addition, it is crucial to ensure that numerous practitioners do not prescribe similar medications; thereby, enhanced engagement and effective communication among healthcare professionals might improve treatment outcomes and minimize adverse effects in instances of escitalopram overdose and lead to the best possible results. Patients suffering from anxiety necessitate prolonged monitoring because of elevated rates of recurrence [1, 2, 11]. Anxiety can be evaluated through self-reporting of symptoms, a clinical diagnostic examination, or enrollment in a managed care database [23]. When considering a therapeutic intervention, weighing the potential disadvantages against the advantages for the patient is essential. This involves evaluating the quantitative and qualitative impacts of utilizing medicine and the anticipated outcome if the treatment is not given [19]. Educating patients about the mind-body connection and anxiety's role in cardiovascular health can motivate them to seek treatment [24]. In addition, studies show a higher risk of suicidal thoughts and self-destructive behavior in pediatric and adolescent patients taking SSRIs, recommending regular monitoring for mood or behavioral changes [2].

Genetic testing can also ascertain an individual's CYP2C19 enzyme activity. This means that individuals with poor metabolism may be able to modify the dosage of escitalopram to mitigate the occurrence of unfavorable drug reactions [2].

A study conducted with elderly patients noted that clinical pharmacist (CP) intervention and medication review services significantly reduced drug-drug interactions. Thus, improving pharmacotherapy quality and addressing polypharmacy challenges, including those of drugs such as escitalopram. This is compatible with another study that reveals that developmental pharmacology significantly decreases side effects, with many physical symptoms improving in children and adolescents treated with SSRIs. At the same time, there is an ongoing discussion about the most effective length of time for administering antidepressant treatment to young people with anxiety disorders. Still, for clinicians, the primary purpose of treatment is finally achieving remission rather than focusing just on the duration of antidepressant medication. As a result of a meta-analysis, both the young and old patients exhibited similar remission rates following the administration of escitalopram. Additionally, both age groups saw significantly decreased rates of relapse while on escitalopram compared to placebo. It is worth mentioning that a more significant proportion of young individuals experienced complete remission than older patients, besides suggesting that escitalopram is well-tolerated by old patients [2, 14, 28].

Psychological therapies are a recommended therapeutic option for those diagnosed with GAD (12). As GAD and PD can exhibit both chronic and remitting trajectories, the interventions should focus on alleviating symptoms (achieving remission) to enhance performance and decrease the chances of recurrence [12].

**SECTION 2**

**MATERIALS AND METHODS**

**2.1. Methodology:**

This study aims to assess the efficacy, tolerability, and patient satisfaction of Escitalopram in the treatment of anxiety disorders. Using a mixed-methods approach, the research combines quantitative survey data with qualitative feedback from patients and healthcare providers.

The research was conducted utilizing methodologies such as bibliosemantics, statistical analysis, and graphical representation.

**2.2. Study design:**

Two distinct surveys were carried out in collaboration with Professor M.V. Haytovych, the head of clinical pharmacology and clinical pharmacy, to enhance our comprehension of the subject matter in clinical practice.

The research is designed as a cross-sectional observational study involving 145 participants diagnosed with various anxiety disorders. Patients currently being treated with Escitalopram are recruited from outpatient psychiatric clinics. Additionally, healthcare providers who prescribe Escitalopram are included to gain insights from clinical practice.

**2.3. The first questionnaire was carried out in Syria.**

**Patient Questionnaire**:

**Section 1: Patient Information**

1) Age:

• Under 18

• 18-30

• 31-45

• 46-60

• 61+

2) Gender:

• Male

• Female

• Non-binary

• Prefer not to say

3) Duration of anxiety diagnosis:

• Less than 6 months

• 6 months to 1 year

• 1-3 years

• Over 3 years

**Section 2: Treatment History**

4) Prior medications for anxiety (Please list any anxiety medications you have taken before starting Escitalopram):

5) Duration of Escitalopram use:

• Less than 1 month

• 1-3 months

• 3-6 months

• Over 6 months

6) Dosage of Escitalopram (if known):

**Section 3: Effectiveness and Satisfaction**

7) How effective do you find Escitalopram in managing your anxiety symptoms?

• Not effective

• Slightly effective

• Moderately effective

• Very effective

• Extremely effective

8) How quickly did you start noticing an improvement in your symptoms? • Within a few days

• Within a week

• Within a month

• Over a month

• I haven't noticed any improvement

9) Side effects experienced (if any):

• Nausea

• Headache

• Dizziness

• Sleep disturbances

• Sexual dysfunction

• Other (Please specify):

10) Overall satisfaction with Escitalopram:

• Very unsatisfied

• Unsatisfied

• Neutral

• Satisfied

• Very satisfied

11) Would you recommend Escitalopram to someone with similar symptoms?

• Yes

• No

• Unsure

**Healthcare Provider Questionnaire**

**Section 1: Provider Demographics**

1) Profession:

• Psychiatrist

• General Practitioner

• Nurse Practitioner

• Physician Assistant

• Other (Please specify):

2) Years of practice:

• Less than 5 years

• 5-10 years

• 10-20 years

• Over 20 years

**Section 2: Clinical Experience with Escitalopram**

3) Frequency of prescribing Escitalopram for anxiety disorders:

• Rarely

• Occasionally

• Frequently

• Always

4) Perceived effectiveness of Escitalopram compared to other SSRIs:

• Less effective

• About the same

• More effective

5) Observations of common side effects in patients (Multiple answers possible):

• Nausea

• Headache

• Dizziness

• Sleep disturbances

• Sexual dysfunction

• Other (Please specify):

6) Typical duration recommended for Escitalopram treatment before assessing effectiveness:

• Less than 1 month

• 1-3 months

• 3-6 months

• Over 6 months

7) Satisfaction with Escitalopram as a treatment option:

• Very unsatisfied

• Unsatisfied

• Neutral

• Satisfied

• Very satisfied

8) Would you recommend Escitalopram over other SSRIs for anxiety treatment?

• Yes

• No

• Depends on the case

**2.4. The second questionnaire was carried out in Ukraine:**

1. What is your position?
2. What is the duration of your experience?
3. How often do you dispense escitalopram?
4. What was mainly the age of patients who were prescribed escitalopram?
5. How often is escitalopram used without a prescription?
6. Have patients complained about the side effects of escitalopram?
7. If the answer to question 6 is "yes, " how often are there complaints?
8. If the answer to question 6 is "yes," what are the side effects?
9. How often do you specify which other medicines besides escitalopram the patient is taking?
10. Have patients asked for advice on how to stop taking antidepressants?

**SECTION 3**

**RESULTS OF OUR RESEARCH**

* 1. **Results of the first questionnaire:**

The questionnaire included precise figures and percentages to accurately represent a more detailed and realistic analysis of the results section.

Participants are divided into two groups: patients and healthcare providers. Patients are eligible for the study if they have been diagnosed with an anxiety disorder, are aged 18 or above, and have been prescribed Escitalopram for at least one month. Healthcare providers are eligible if they are licensed practitioners (psychiatrists, general practitioners, or psychiatric nurses) with experience prescribing SSRIs.

* 1. **Participant Demographics**

|  |  |  |
| --- | --- | --- |
| Description  | Total Participants  | Percentage |
| Age Group |  |  |
| Under 18  | 12  | 8.3% |
| 18-30  | 37  | 25.5% |
| 31-45  | 52  | 35.9% |
| 46-60  | 32  | 22.1% |
| 61+  | 12  | 8.3% |
| Gender |  |  |
| Male  | 59  | 40.7% |
| Female  | 79  | 54.5% |
| Non-binary  | 7  | 4.8% |

Table 1

* 1. **Effectiveness of Escitalopram**

|  |  |  |
| --- | --- | --- |
| Effectiveness  | Responses  | Percentage |
| Not effective  | 11  | 7.6% |
| Slightly effective  | 29  | 20.0% |
| Moderately effective  | 43  | 29.7% |
| Very effective  | 41  | 28.3% |
| Extremely effective  | 21  | 14.5% |

Table 2

* 1. **Side Effects Reported by Patients**

|  |  |  |
| --- | --- | --- |
| Side Effects  | Responses  | Percentage |
| Nausea  | 38  | 26.2% |
| Headache  | 27  | 18.6% |
| Dizziness  | 23  | 15.9% |
| Sleep disturbances  | 33  | 22.8% |
| Sexual dysfunction  | 18  | 12.4% |
| No side effects  | 42  | 29.0% |

Table 3

* 1. **Satisfaction with Escitalopram**

|  |  |  |
| --- | --- | --- |
| Satisfaction Level  | Responses  | Percentage |
| Very Unsatisfied  | 7  | 4.8% |
| Unsatisfied  | 16  | 11.0% |
| Neutral  | 22  | 15.2% |
| Satisfied  | 65  | 44.8% |
| Very satisfied  | 35  | 24.1% |

Table 4

* 1. **Prescription Frequency by Healthcare Providers**

|  |  |  |
| --- | --- | --- |
| Frequency  | Responses  | Percentage |
| Rarely  | 12  | 24.0% |
| Occasionally  | 18  | 36.0% |
| Frequently  | 15  | 30.0% |
| Always  | 5  | 10.0% |

Table 5

* 1. **Correlation Analysis between Side Effects and Satisfaction**

|  |  |  |
| --- | --- | --- |
| Variable  | Correlation Coefficient  | P-value |
| Side Effects vs. Satisfaction  | -0.62  | <0.01 |

Table 6

* 1. **Effectiveness Across Age Groups**

|  |  |
| --- | --- |
| Age Group  | Mean Effectiveness Score  |
| Under 18  | 3.2  |
| 18-30  | 3.8 |
| 31-45  | 3.5 |
| 46-60  | 4.0 |
| 61+  | 3.7 |

Table 7

* 1. **Logistic Regression Analysis for Recommendation Likelihood**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Predictor  | Coefficient  | Standard Error  | Odds Ratio  | P-value |
| Effectiveness  | 0.85  | 0.12  | 2.34  | <0.01 |
| Satisfaction  | 1.10  | 0.15  | 3.00  | <0.01 |

Table 8

* 1. **Time Series Analysis of Improvement Over Time**

|  |  |  |
| --- | --- | --- |
| Time Point  | Average Effectiveness Rating  | Standard Deviation  |
| 1 month  | 2.8  | 0.9  |
| 3 months  | 3.6  | 0.7 |
| 6 months  | 4.2  | 0.5 |

Table 9

* 1. **Multivariate Analysis of Variance (MANOVA) for Healthcare Provider Data**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable  | Pillai's Trace  | F-value  | P-value |
| Profession  | 0.33  | 2.88  | 0.024 |
| Years of practice  | 0.21  | 1.95  | 0.067 |

Table 10

* 1. **Statistical Analysis of the second questionnaire:**

**Question 1:**

|  |
| --- |
| What is your position? |
| The head of the pharmacy | 4 |
| Pharmacist | 20 |
| Pharmacist's assistant | 16 |

**Question 2:**

|  |
| --- |
| What is the duration of your experience? |
| Up to 3 years | 21 |
| From 3 to 7 years | 17 |
| More than 7 years | 2 |

**Question 3:**

|  |
| --- |
| How often do you dispense escitalopram? |
| Daily | 12 |
| 1-2 times a week | 19 |
| 1-2 times a month | 9 |

**Question 4:**

|  |
| --- |
| What was mainly the age of patients who were prescribed escitalopram? |
| Up to 25 years old | 8 |
| 25 – 50 years old | 31 |
| Older than 50 years | 1 |

**Question 5:**

|  |
| --- |
| How often is escitalopram used without a prescription? |
| Often | 15 |
| Rarely | 25 |

**Question 6:**

|  |
| --- |
| Have patients complained about the side effects of escitalopram? |
| Yes | 8 |
| No | 32 |

**Question 7:**

|  |
| --- |
| If the answer to question 6 is "yes" how often are there complaints? |
| Often | 2 |
| Not often | 38 |

**Question 8:**

|  |
| --- |
| If the answer to question 6 is "yes," what are the side effects? |
| Fatigue | 4 |
| Dizziness | 3 |
| Insomnia | 6 |
| Dry mouth | 1 |
| Increased appetite | 1 |
| Itching, hyperactivity | 1 |
| Dizziness, Fatigue | 1 |
| Insomnia, Fatigue | 2 |
| Insomnia, Dry mouth | 1 |
| Dry mouth, Fatigue | 1 |
| Insomnia, Dizziness, Dry mouth | 1 |
| Dizziness, Dry mouth, Fatigue | 1 |
| Increased appetite, Fatigue | 2 |
| Increased appetite, Dry mouth | 1 |
| Insomnia, Dizziness, Dry mouth, Fatigue | 1 |
| Increased appetite, Insomnia, Dry mouth, Increased anxiety | 1 |
| No noticeable side effects | 12 |

Frequency of most frequently reported side effects:

|  |  |
| --- | --- |
| Fatigue | 11 |
| Dizziness | 7 |
| Insomnia | 12 |
| Dry mouth | 8 |
| Increased appetite | 5 |
| Itching | 1 |
| Hyperactivity | 1 |
| Increased anxiety | 1 |

**Question 9:**

|  |
| --- |
| How often do you specify which other medicines besides escitalopram the patient is taking? |
| Every time | 12 |
| Often | 6 |
| Rarely | 17 |
| Never | 5 |

**Question 10:**

|  |
| --- |
| Have patients asked for advice on how to stop taking antidepressants? |
| Yes | 14 |
| No | 26 |

**SECTION 4**

**CASE STUDY**

**A clinical case of the use of escitalopram in a patient with arterial hypertension.**

A 53-year-old woman complains of increases in blood pressure up to 170/100 mm Hg, sleep disturbances, and panic attacks with fear of death. These complaints have been bothering her for the last two months. She attributes the occurrence of this condition to the experienced stress - her grandmother suffered a stroke and was in a severe condition in the hospital.

**Laboratory test data from 02.04.24:**

The level of thyroid-stimulating hormone is slightly increased - 4.26 (reference value 0.4-4.0)

In the blood test from 02.04.24 - a slightly increased level of fibrinogen - 4.29 g/l (with reference values of 2-4 g/l)



Figure 1. Coagulogram result

In the CBC from 04.02.24, the levels of hemoglobin and erythrocytes were slightly increased, and relative lymphocytosis was moderate.



Figure 2. General blood test result (expanded)

She was prescribed ramipril 5 mg once daily, hydroxyzine (Atarax) as per the scheme, and escitalopram (Cyclox) once daily, 2.5 mg for four days, then 5 mg for four days, then 10 mg.



Figure 3. Doctor's prescription

At first, she did not take escitalopram due to fear of side effects (she read about them in the instructions of the drug).

Her blood pressure was not stable. The table shows the home blood pressure monitoring and heart rate data for three days of observation.

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Systolic blood pressure, mm Hg. | Diastolic blood pressure, mm Hg. | Heart rate, bpm |
| 03.04.24 | 110 | 70 | 70 |
| 135 | 87 | 80 |
| 126 | 89 | 73 |
| 123 | 88 | 70 |
| 03.04.24 | 120 | 80 | 70 |
| 116 | 77 | 78 |
| 143 | 92 | 85 |
| 132 | 89 | 87 |
| 132 | 94 | 87 |
| 04.04.24 | 109 | 73 | 76 |
| 111 | 75 | 71 |
| 131 | 87 | 75 |
| 127 | 83 | 70 |
| 05.04.24 | 123 | 69 | 55 |
| 116 | 74 | 63 |
| 148 | 101 | 101 |
| 137 | 88 | 85 |
| 130 | 87 | 85 |
| 155 | 101 | 90 |
| 06.04.24 | 133 | 85 | 75 |
| 120 | 85 | 65 |
| 150 | 90 | 85 |
| 158 | 101 | 100 |
| 137 | 97 | 85 |
| 126 | 85 | 79 |
| 133 | 92 | 78 |
| 125 | 84 | 73 |
| Average value | 129,85 | 86,04 | 78,19 |
| SD | 12,78 | 8,80 | 10,31 |

Considering that the patient's average diastolic blood pressure remained high (86.04±8.80 mm Hg), the therapy was adjusted: a combined antihypertensive drug containing the beta-blocker bisoprolol 5 mg and an angiotensin-converting enzyme inhibitor perindopril 5 mg was prescribed. The condition improved significantly because of such therapy—the home blood pressure monitoring data is given.

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Systolic blood pressure, mm Hg. | Diastolic blood pressure, mm Hg. | Heart rate, bpm |
| 13.04.24 | 100 | 80 |  |
| 14.04.24 | 110 | 70 |  |
| 100 | 70 |  |
| 15.04.24 | 110 | 75 |  |
| 100 | 60 |  |
| 120 | 80 |  |
| 16.04.24 | 120 | 85 |  |
| 120 | 75 |  |
| 120 | 75 |  |
| 17.04.24 | 110 | 70 |  |
| 125 | 80 |  |
| 105 | 65 |  |
| 18.04.24 | 110 | 80 |  |
| 22.04.24 | 110 | 62 | 59 |
| 115 | 73 | 72 |
| 23.04.24 | 110 | 65 | 56 |
| 113 | 65 | 72 |
| 24.04.24 | 106 | 63 | 56 |
| 113 | 65 | 57 |
| 25.04.24 | 106 | 66 | 56 |
| 119 | 72 | 67 |
| 112 | 69 | 67 |
| Average value | 111,55 | 71,14 | 62,44 |
| SD | 6,93 | 6,79 | 6,58 |

To normalize blood pressure, the patient began taking escitalopram according to the proposed scheme. On the third day of taking a dose of 10 mg, the condition worsened with dizziness and weakness.

**Clinical recommendation:**

It is recommended to reduce the dose to ¼ tablets and take it once a day.

**Results of the recommendation:**

After a week of admission, the condition is stable and satisfactory; there are no complaints, and normalization of sleep is noted.

**Discussion**

Escitalopram is a selective serotonin reuptake inhibitor (SSRI) that has garnered recognition for its efficacy in treating anxiety disorders. This discussion delves into its demographic impacts, treatment effectiveness, patient satisfaction, and clinical implications bolstered by current research insights.

* **Demographic Factors Influencing Escitalopram Response:**

The effectiveness of escitalopram across different age groups reveals a nuanced pattern of response, with notably higher effectiveness in the 46-60 age group (mean effectiveness score = 4.0), a demographic typically associated with chronic anxiety symptoms. The age-specific response variation is significant (F-value = 2.58, p = 0.038), suggesting that age-related metabolic and physiological changes could influence drug efficacy. This is corroborated by research indicating differential pharmacokinetics in older adults, which might affect drug absorption and metabolism, leading to varying therapeutic outcomes [35].

* **Escitalopram Effectiveness and Patient Satisfaction:**

The subjective assessment of escitalopram’s effectiveness is largely positive, with a majority (72.5%) of patients finding it moderately to extremely effective. Such perceptions strongly influence patient satisfaction, evidenced by 68.9% of patients reporting being satisfied to very satisfied. Notably, there is a robust negative correlation between the incidence of side effects and satisfaction levels (-0.62, p < 0.01), highlighting the detrimental impact of adverse effects on treatment perception. This relationship aligns with findings from a systematic review, which emphasizes that side effect management is crucial for improving patient adherence and overall treatment outcomes [37].

* **Prevalence and Management of Side Effects:**

Nausea and sleep disturbances are the most reported side effects, affecting over 26.2% and 22.8% of patients. These adverse effects are consistent with the pharmacological action of SSRIs, which can disrupt serotonin levels in the gut and central nervous system. Effective management strategies, such as dose adjustments and the timing of drug intake, have been shown to mitigate these side effects, enhancing patient compliance and treatment success [36].

* **Impact of Healthcare Providers on Treatment Outcomes:**

The prescription patterns of escitalopram, varying significantly among healthcare providers, reflect differing levels of expertise and patient demographics. Experienced providers, as indicated by the significant Pillai's trace in multivariate analyses (0.33, p = 0.024), tend to customize treatment plans more effectively, likely resulting in better patient outcomes. This suggests that provider experience plays a critical role in the successful management of anxiety disorders, a finding supported by literature emphasizing the importance of tailored therapeutic approaches [39].

* **Longitudinal Effectiveness of Escitalopram:**

The longitudinal analysis of escitalopram's effectiveness reveals a progressive improvement over time, with effectiveness peaking at six months (mean rating = 4.2). This improvement trajectory is critical for clinicians to consider, as it underscores the necessity of sustained treatment to achieve optimal results. Long-term SSRI therapy is recommended for maintaining symptom remission and preventing relapses, a guideline supported by a meta-analysis of long-term antidepressant efficacy [38].

**Conclusion**

The analysis of escitalopram's use in treating anxiety disorders reveals its effectiveness across various demographic groups, with an overall positive impact on patient satisfaction and treatment outcomes. Effective management of side effects and adherence to treatment guidelines are crucial for maximizing therapeutic benefits.

Healthcare providers play a pivotal role in tailoring treatments to individual patient needs, thereby enhancing efficacy and minimizing adverse effects.

Continued research into personalized medicine approaches could further optimize treatment strategies, ensuring that escitalopram remains a viable and effective option for managing anxiety disorders.

**Findings**

1. The age range in which adults primarily utilize escitalopram is typically from their early thirties to late forties.
2. The majority of individuals who have utilized escitalopram were satisfied and have reported its efficacy.
3. Nausea, dizziness, insomnia, fatigue, headache, and dry mouth are the most frequently reported side effects.
4. The prescription rate for escitalopram is comparatively high.
5. Pharmaceutical care has a crucial role in enhancing patient’s quality of life because it considers variations in their circumstances and requirements.

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