IBN HALDUN UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF CLINICAL PSYCHOLOGY

DOCTORAL THESIS

ONLINE VERSIONS OF SINGLE-SESSION VIRTUAL REALITY THERAPY AND EMDR FLASH THERAPY ON THE TREATMENT OF FLYING FEAR

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THESIS SUPERVISOR
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ISTANBUL, 2025

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by
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A thesis submitted to the School of Graduate Studies in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Clinical Psychology

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ACADEMIC HONESTY ATTESTATION

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ÖZ

UÇUŞ KORKUSU TEDAVİSİNDE TEK SEANSLIK ONLİNE SANAL GERÇEKLİK TERAPİSİ VE EMDR FLASH TEKNİK MÜDAHALELERİ

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Bu araştırmanın amacı, tek seanslık çevrimiçi Sanal Gerçeklik Maruziyet Terapisi (OVRET) ve EMDR Flash Tekniği'nin uçuş korkusu üzerindeki etkilerini karşılaştırmalı olarak gevşeme veya nefes egzersizleri içermeden değerlendirmektir. Bu çalışmada, 18-65 yaş arası 62 gönüllü katılımcı rastgele OVRET grubuna, çevrimiçi flaş tekniği grubuna veya sadece psikoeğitim grubuna ayrılmıştır. Çalışmada veriler Uçuş Kaygısı Durumları Anketi (FAS) ve Uçuş Kaygısı Tarzı Anketi (FAM), Uçuş Kaygısı Görsel Analog Testi (VAFAS) ve tedaviden sonraki bir ay içinde gerçekleştirilen gerçek uçuş deneyimi ile elde edilmiştir. Araştırmada, OVRET ve EMDR Flash grupları ile yalnızca psiko-eğitim alan kontrol grubu karşılaştırılmıştır. Bulgular, OVRET ve EMDR Flash gruplarında uçuş korkusu ve kaygı düzeylerinde anlamlı azalmalar olduğunu göstermiştir; özellikle OVRET grubu, FAS (Flight Anxiety Situations), FAM (Flight Anxiety Modality) ve VAFAS (Visual Analogue Flight Anxiety Scale) testlerinde psiko-eğitim grubuna kıyasla daha belirgin iyileşme göstermiştir. EMDR Flash Teknik grubu ise, özellikle VAFAS testinde anlamlı bir azalma sağlamış, ancak FAS ve FAM testlerinde psiko-eğitim grubuna göre anlamlı bir fark göstermemiştir. Her iki müdahale de kısa sürede kaygı ve korkuyu azaltmada etkili bulunmuş, OVRET'in ise daha bütüncül bir etki sağladığı görülmüştür. Bulgulara göre, tek seanslık çevrimiçi OVRET ve kısmen EMDR Flash Tekniği, uçuş korkusunun kısa sürede azaltılmasında gevşeme veya nefes egzersizleri olmaksızın

etkili, erişilebilir ve yenilikçi müdahaleler olarak öne çıkmaktadır. Bu çalışma, 27 Aralık 2024 tarihinde ClinicalTrials.gov'da (Kayıt numarası: NCT06758635) kaydedilmiştir ve proje İbn Haldun Üniversitesi Bilimsel Araştırma Projeleri Komisyonu tarafından desteklenmiştir (Project No:2238).

Anahtar Kelimeler: EMDR, Flash Teknik, Sanal Gerçeklik Terapisi, Tek Seans, Uçuş Korkusu.

ABSTRACT

ONLINE VERSIONS OF SINGLE-SESSION VIRTUAL REALITY THERAPY AND EMDR FLASH THERAPY ON THE TREATMENT OF FLYING FEAR

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This study aims to compare the effects of a single-session online Virtual Reality Exposure Therapy (OVRET) and the EMDR Flash Technique on fear of flying, without incorporating relaxation or breathing exercises. Accordingly, 62 volunteers aged 18 to 65 were randomly allocated to one of three groups: OVRET, online flash technique, or psycho-education-only. The data were collected using the Flight Anxiety Situations Questionnaire (FAS), the Flight Anxiety Modality Questionnaire (FAM), the Visual Analogue Flight Anxiety Scale (VAFAS), and a real flight experience conducted one month after treatment. The study compared the OVRET and EMDR Flash groups with a control group that received only psycho-education. The findings showed significant reductions in flight fear and anxiety levels in the OVRET and EMDR Flash groups; in particular, the OVRET group showed more pronounced improvement in the FAS (Flight Anxiety Situations), FAM (Flight Anxiety Modality), and VAFAS (Visual Analogue Flight Anxiety Scale) tests compared to the psycho-education group. The EMDR Flash Technique group achieved a significant reduction, particularly on the VAFAS test, but did not show a significant difference compared to the psycho-education group on the FAS and FAM tests. Both interventions were found to be effective in reducing anxiety and fear in a short period of time, with OVRET providing a more comprehensive effect. According to the findings, single-session OVRET and partially online EMDR Flash Technique stand out as practical, accessible,

and innovative interventions for reducing flight anxiety in a short period without relaxation or breathing exercises. This study was registered with ClinicalTrials.gov on December 27, 2024 (Registration number: NCT06758635), and the project was supported by the Scientific Research Projects Commission of Ibn Haldun University (Project No. 2238).

Keywords: EMDR, Fear of Flying, Flash Technique, Online Session, Virtual Reality Therapy.

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This doctoral thesis was not merely a scientific study for me; it was a life journey, a vision of life, and an instructive life teacher. Hard work, discipline, encouragement and collective support were essential for the achievement of this doctoral thesis.

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LIST OF SYMBOLS AND ABBREVIATIONS

AIP	Adaptive Information Processing
ANOVA	Analyses of Variance
APA	American Psychological Association
BLS	Bilateral Stimulation
CBT	Cognitive Behavioural Therapy
CGI	The Clinical Global Impressions Scale
CS	Conditioned Stimulus
DSM	Diagnostic and Statistical Manual of Mental Disorders
E-CBT	Electronic Cognitive Behavioural Therapy
E-EMDR	Electronic Eye Movement and Desensitisation Therapy
EMDR	Eye Movement and Desensitisation Therapy
FAS	Flight Anxiety Situations Questionnaire
FAM	Flight Anxiety Modality Questionnaire
OCD	Obsessive Compulsive Disorder
PEF	Positive Engaging Focus
PTSD	Post Traumatic Stress Disorder
RCT	Randomised Controlled Trial
R-TEP	Recent Traumatic Episode Protocol
SAD	Social Anxiety Disorder
SUDs	Subjective Units of Distress Scale
UC	Unpleasant Condition
VAFAS	Visual Analogue Fear of Flying Scale
VR	Virtual Reality
VRET	Virtual Reality Exposure Therapy
VRGET	Virtual Reality Graded Exposure Therapy
OVRET	Online Virtual Reality Exposure Therapy

CHAPTER I

INTRODUCTION AND AIM

Recent developments in air travel have led to a significant increase in the number of people flying. Air travel has become nearly unavoidable for individuals in today's rapidly changing world. While airline travel has been convenient for humanity, it can also be hectic for some travellers, particularly those who suffer from high levels of fear and anxiety. Therefore, as the number of air passengers increases, the unpleasant aspects of flying become more prevalent for a greater number of individuals (Gerwen & Diekstra, 2000). Aviophobia is prevalent among anxiety disorders, causing significant distress and numerous challenges in individuals' lives (Carlo et al., 2016).

Aviophobia affects approximately 6%–10% of adults worldwide and, in turn, leads to millions of potential passengers not travelling annually (Opris et al., 2012; Rothbaum et al., 2019). Aviophobia may significantly decrease the quality of life by limiting relationships, increasing anxiety and stress, contributing to job-related stress and burnout, and creating societal issues (Abuso et al., 2023; Laker et al., 2024; Oakes & Bor, 2010a).

Recently, technology-assisted psychotherapy applications have made significant advances in the treatment of anxiety disorders, particularly phobias. Virtual reality (VR)- based therapies allow individuals to confront their fears in a controlled, safe environment. At the same time, innovative methods such as Eye Movement Desensitisation and Reprocessing (EMDR) and the flash technique are effective in reducing the emotional burden of traumatic memories (Freeman et al., 2017; Greenwald, 2017; Shapiro, 2018). These strategies improve access to psychotherapy, making it more efficient, effective, and personalised.

Numerous studies have been conducted on the treatment of phobias using Virtual Reality Exposure Therapy (VRET) with multiple sessions (Botella et al., 2017; Price

et al., 2008). Despite traditional multi-session therapies for aviophobia suffering from time and cost limitations (Donker, 2022). Conversely, single-session exposure therapy for specific phobia is more time-efficient than multi-session therapy; nonetheless, both methods show no significant differences in efficacy (Odgers et al., 2022). Single-session therapies have been shown to effectively treat aviophobia by providing immediate and long-lasting reductions in the severity of the phobia. These effects have been maintained during follow-up periods of up to one year (Mühlberger et al., 2003; 2006). This approach combines CBT with VRET to help individuals cope with the adverse effects of their phobia (Mühlberger et al., 2003).

The single-session online format significantly reduces indirect costs, including travel, accommodation, and time loss, for both mental health professionals and participants. Consequently, it reduces the barriers to accessing therapy and alleviates the strain on healthcare systems and personal finances (Davis et al., 2019).

Despite extensive research on VRET and the flash technique, there is a scarcity of publications examining their effectiveness in online settings (Brouwers et al., 2021; Fehribach et al., 2021). The rapid growth of therapeutic services on online platforms following COVID-19 has not been accompanied by sufficient rigorous research on the online applicability and efficacy of VRET and the flash technique. Therefore, the online effectiveness of VRET for the treatment of aviophobia remains unclear (Manfield et al., 2021; Ozdil Arikan, 2025). Moreover, the use of VRET and the flash technique, both online and in a single session, for aviophobia is nonexistent. Finally, several studies on aviophobia have incorporated relaxation strategies, such as muscle relaxation and breathing exercises. The source of the intervention effect remains ambiguous, as it may stem from exposure, the flash technique, or relaxation and breathing exercises. Accordingly, research that includes only exposure and flash techniques is crucial for identifying the origin of this intervention effect. Therefore, the present study aimed to demonstrate the impact of the intervention, excluding relaxation exercises.

The objective of the present study is to address and expand the existing literature by filling the identified gaps. The study aims to mitigate the adverse symptoms of aviophobia and enhance the perception of flight experiences through the

implementation of single-session Online Virtual Reality Exposure Therapy (OVRET) and online EMDR flash technique protocols specifically developed for this research, with the goal of achieving rapid and effective results. Therefore, the long-term objective is to establish more calm and comfortable flying practices for clients with aviophobia. Passengers with reduced anxiety symptoms and calm, cooperative behaviour may contribute to the reduced workload for the crew during the flight.

This study may enhance flight safety on both individual and operational levels. The goal is to help people overcome their aviophobia by developing a quick, accessible, and low-cost intervention model that also significantly contributes to the economic and operational efficiency of both the aviation and tourism industries. Therefore, aviophobia will be a more manageable problem to overcome and will provide numerous social and economic benefits. In conclusion, this study aims to create a unique, multidimensional value by both presenting an innovative treatment model in the literature of clinical psychology and addressing an indirect yet critical need in the aviation industry.

1.1. Rationale

Two hundred and twelve various aviophobia treatment facilities and airline programs are employed all around the world to help people overcome their fears of flying. The two essential components of these programs are information about flight and exposure-therapeutic flight. These programs also include several components, such as information on aviation and anxiety, relaxation techniques, cognitive restructuring, simulator-based exposure, therapeutic flight, and re-prevention (Gerwen & Wolfger, 2004). While these multifaceted programs provide a broad foundation for addressing aviophobia, the need for more targeted, evidence-based interventions has become increasingly apparent. Therefore, the following sections will elaborate on the theoretical rationales and mechanisms of action underlying EMDR, VRET, online psychotherapy, OVRET, and single-session psychotherapy approaches, which represent innovative and empirically supported strategies for treating fear of flying.

1.1.1. Eye Movement Desensitization and Reprocessing (EMDR)

As it is known EMDR has been studied in the treatment several areas such as anxiety disorders (Shapiro, 1999), depression (Carletto et al., 2017), eating disorders (Bloomgarden & Calogero, 2008), obsesif compulsive disorder (OCD) (Marr, 2012), psychosis (van den Berg et al., 2013), pain (Grant & Threlfo, 2002), PTSD (Scelles & Bulnes, 2021), sexual dysfunction (Leiblum & Wiegel, 2002) and among other mental health issues (Cuijpers et al., 2020). Flash technique, a recent adaptation of EMDR therapy, has been implemented alongside the traditional EMDR method (Konuk, 2019; Manfield et al., 2017; Wong, 2019). While both methods are employed in clinical practice, only classical EMDR is utilised for the treatment of aviophobia (Lapsekili & Yelboga, 2014; Newgent et al., 2006; Triscari et al., 2010, 2015). The application of the flash technique in anxiety disorders (Manfield et al., 2017) represents a significant advancement for the treatment of aviophobia.

1.1.2. Virtual Reality Exposure Therapy (VRET)

Virtual Reality Therapy (VRET) is a therapy method that has been widely utilised and found to be useful in numerous conditions, such as anxiety disorders (Powers & Emmelkamp, 2008), OCD (Cullen et al., 2021), substance-related disorders (Tsamitros et al., 2021), pain (Keefe et al., 2012), psychosis (Lambe et al., 2020), PTSD (Difede et al., 2006), eating disorders (Perpiñá et al., 2003), autism (Parsons & Cobb, 2011) and other mental health disorders (Emmelkamp & Meyerbröker, 2021; Wiederhold & Riva, 2019). Alongside these topics, numerous studies have examined the effectiveness of VRET in the treatment of aviophobia (Baños et al., 2002; Maltby et al., 2002; Öst et al., 1997; Rothbaum et al., 2002; Mühlberger et al., 2001).

1.1.3. Online Therapy

Today, the importance of online treatments is emerging due to time constraints, the difficulty of reaching a specialist, and the situation brought about by the pandemic (Perri et al., 2021). Is aviophobia also treated online? Despite numerous publications regarding the application of EMDR, there is a scarcity of studies focused on online EMDR therapy (Lenferink et al., 2020; Spence et al., 2013; Perri et al., 2021).

Flash Technique: The Flash technique of EMDR is also for anxiety disorders treatment (Manfield et al., 2017; Wong, 2019). This study aims to utilise the flash technique on an online platform, potentially contributing to the treatment of aviophobia. Only one study has been identified concerning the online application of the flash technique; however, there is no evidence of its application in the treatment of aviophobia (Manfield et al., 2021). Therefore, since this technique is especially suitable for online use, developing and testing its online protocol will be an important contribution to the field.

1.1.4. Online Virtual Reality Exposure Therapy (OVRET)

Although numerous studies have examined VRET, there are very few publications on its online effectiveness (Levy et al., 2016; Wiederhold, 2018). Although there are several publications on the treatment of aviophobia with VRET, no research has been found on the treatment of aviophobia with online VRET. For this reason, the online effectiveness of VRET remains unclear for aviophobia. This research is expected to significantly contribute to the literature by developing and implementing a protocol for the treatment of aviophobia using online VRET.

1.1.5. Single-Session Psychotherapy

Numerous publications report the efficacy of VRET, involving multiple sessions, for the treatment of phobias (Botella et al., 2017; Price et al., 2008). Single-session interventions can be both rapid and effective for addressing specific phobias (Öst, 1989). Moreover, it has been noted that single-session VRET is effective in reducing aviophobia (Mühlberger et al., 2001, 2006). However, few studies demonstrate the effectiveness of VRET conducted in a single session (Mühlberger et al., 2003). In the literature, short-term VRET online study protocols related to aviophobia are not very limited. There is a gap in the literature on short-term online treatment for aviophobia, and this study aimed to contribute to the field.

As we have seen in the literature, virtual reality therapy is a helpful instrument to heal patients with anxiety disorders (Power & Emmelkamp, 2008); it was considered that it could also help alleviate flying anxiety. It enables therapists to manage unpredictable

situations that may arise in real conditions and adjust the intensity of exposure accordingly. Furthermore, virtual reality therapy reduces expenses associated with in vivo therapy, including airfare and ticket costs (Cote & Bouchard, 2008).

Single treatment sessions have long been recognised as a valid and scientifically validated method of psychotherapy (Young & Jebreen, 2019). Single therapy sessions enhance therapeutic efficiency, decrease referral and waiting lists, and promote a collaborative, client-centred approach to therapy (Young & Rycroft, 2012). The shortage of treatment methods for addressing flying fears, especially within a limited timeframe, underscores the potential of virtual reality therapy in aviation. This approach could substantially expand treatment options for clients with a fear of flying.

Flying is an unavoidable aspect of the transportation sector; nonetheless, air travel is a stressful and unpleasant experience for a growing number of people who fear flying. (Van Gerwen & Diekstra 2000). Air travel is a crucial element of the tourist experience and accounts for a substantial portion of the overall costs (Fleischer et al., 2012). Dear and Whitaker (1982) estimate that fear of flying results in a loss of 21 million one-way flights annually for the US air travel sector, translating to a revenue decrease of $1.6 billion each year. Reducing the fear of flying yields several advantages for the aviation sector:

a. Less economic cost
b. Increasing domestic and international tourist visits
c. Positive attitude towards flying. Contribution to safe travel

1.2. The Design of the Present Study

As discussed above, both VRET and EMDR are widely used in anxiety disorders (Powers & Emmelkamp, 2008; Shapiro, 1999). In the present research, online VRET and online EMDR-flash technique will be compared. There are very few publications comparing virtual reality therapy and EMDR (Triscari et al., 2015); however, no study has compared VRET and EMDR flash technique for aviophobia. This study examines the two techniques simultaneously for several reasons. Both techniques enable the therapist to utilise online platforms, ensuring client privacy and accessibility. The

online nature of the study removes constraints related to therapy location and the time needed to attend sessions. Both therapies possess the potential to engage a larger client base. Compared with in vivo methods, both approaches entail a lower economic burden and may reduce dropout rates by minimising direct exposure to in vivo conditions (Mühlberger et al., 2003). Furthermore, few publications are comparing VRET and EMDR therapy, and no studies have compared VRET with the flash technique. This thesis is expected to address a significant gap in the existing literature.

1.3. Statement of Purpose

Although aviophobia is treated with several therapy methods, the current study has adopted a functional therapy method that will provide a solution in a shorter time. There are a few publications on the single-session treatment of aviophobia (Mühlberger et al., 2010; Öst et al., 1997). Specific phobia studies with EMDR have shown that EMDR therapy benefits with a limited number of sessions (De Jongh, 2016; Jongh et al., 2002; McNeal, 2001; Newgent et al., 2006). It is challenging for both the therapist and the client to maintain lengthy sessions, and it is also challenging to prevent clients from dropping out. The present study sought to establish a protocol for EMDR and VRET within a session framework.

Although CBT is the mainstream in the aviophobia treatment, VRET and EMDR were found to be similarly effective (Triscari et al., 2015). The flash technique aims to revert to the standard EMDR protocol by rapidly and painlessly reducing the intensity of distressing memories during the EMDR preparation phase (Manfield et al., 2017). Despite being a recent technique, research on homeless individuals with dissociative disorders (Wong, 2019), PTSD symptoms in COVID-19 patients and mental health professionals during the pandemic (Manfield et al., 2021), and applications of the single-session flash technique in group settings (Yasar et al., 2019) demonstrate its effectiveness.

The COVID-19 pandemic underscored the importance of online therapy. When implemented effectively, online therapy provides a safe, supportive setting for clients to address stress management (Wiederhold, 2018). VRET is beneficial online; however, care should be taken, as research in this area is limited. The level of

compliance with clients can be measured using online scales (Botha-Ravyse et al., 2020). Additionally, online cognitive-behavioural therapy (CBT) or eye movement desensitisation and reprocessing (EMDR) was administered to 38 patients diagnosed with acute stress disorder. The results indicated a 30% reduction in anxiety symptoms and a 50% reduction in depression symptoms (Perri et al., 2021).

Few intervention programs exist that do not incorporate in vivo exposure, and limited research has been conducted on single session aviophobia intervention programs. The online therapy program is constrained, and there is an absence of a single-session intervention program utilising EMDR. This research aims to investigate the effectiveness of online cognitive-behavioural therapy (CBT) utilising virtual reality exposure therapy (VRET) and online eye movement desensitisation and reprocessing (EMDR) employing the flash technique for the treatment of aviophobia in a single session. The efficacy of the two techniques will be assessed using the aviophobia scales.

In a rapidly changing technological era, aviation has become an indispensable component of our global society. In the current technological era, various remedy programs, including anxiety management techniques, psycho-education regarding flight, and exposure methods, have been developed to assist clients with aviophobia in overcoming their anxiety (Triscari et al., 2015). Therefore, aviophobia has been treated in several ways: medical treatment, CBT therapy, systematic desensitisation and imaginal exposure therapy, in vivo therapy, interoceptive exposure, VRET or applied tension, EMDR therapy and other treatments. There are several treatment methods for phobias, but two stand out as particularly compelling: CBT and EMDR.

CHAPTER II

LITERATURE REVIEW

2.1. Anxiety Disorders and Phobias

Anxiety typically refers to the concern regarding potential hazardous situations that may arise in the future. Anxiety encompasses a condition wherein individuals concentrate on the more expected elements (First, 2013; Kring et al., 2019). Thus, an individual experiencing turbulence on an aircraft feels fear, while a student preparing for an exam is anxious about the possibility of failing.

Anxiety was defined by the American Psychological Association (APA) Dictionary of Psychology (American Psychological Association [APA], 2015):

> "An emotion characterised by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune. The body often mobilises itself to meet the perceived threat: muscles become tense, breathing becomes faster, and the heart beats more rapidly. Anxiety may be distinguished from fear both conceptually and physiologically, although the two terms are often used interchangeably. Anxiety is considered a future-oriented, long-acting response broadly focused on a diffuse threat. In contrast, fear is an appropriate, present-oriented, and short-lived response to a clearly identifiable and specific threat" (American Psychological Association, 2015).

Over the past decade, there has been a growing research-based awareness of the impact and consequences of untreated anxiety. Clinical studies indicate that persons with anxiety disorders are at an increased risk of developing additional anxiety, mood, and drug use disorders (Remes et al., 2016).

Anxiety disorders are the most prevalent psychiatric disorders in the general population. A study involving 9282 adults in American society, based on DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) criteria, found that the prevalence of anxiety disorder was 28.8% (Kessler et al., 2005). A study assessing the prevalence of DSM-IV disorders in the American population indicated that the 12-

month prevalence of anxiety disorders was 18.1% (Kessler et al., 2005). Anxiety is one of the most prevalent diseases in numerous countries around the world. A comprehensive analysis and meta-regression by 87 researchers across 44 nations revealed that the global prevalence of anxiety disorders ranges from 0.9% to 28.3% (Baxter et al., 2013). A systematic review expanded to cover Asian nations, increased physical and mental diseases, and anxiety-related trauma. The systematic review, which included 48 reviews, described the prevalence of anxiety across population subgroups and found that anxiety disorders were more common in people from Euro/Anglo cultures (3.8-10.4%) than in those from North African/Middle Eastern (4.9%), Indo/Asian (2.8%), Ibero/Latin (6.2%), African (4.4%), and Central/Eastern European (3.2%) cultures (Remes et al., 2016).

The DSM-5 (First, 2013) delineates various anxiety disorders, including separation anxiety disorder, selective mutism, specific phobia, social phobia, panic disorder, agoraphobia, generalised anxiety disorder, substance/medication-induced anxiety disorder, and anxiety disorder caused by another medical condition, each characterised by distinct symptom clusters. Although anxiety and fear are intimately associated, they can be frequently misunderstood. A specific phobia refers to a particular type of intense, persistent, and irrational fear, such as a fear of flying or heights. In contrast, panic refers to a state of intense and acute anxiety accompanied by all cognitive, physiological, and motor symptoms (Beck & Emery, 2017). The American Psychological Association's (APA) Dictionary of Psychology distinguishes between fear and anxiety. An excessive emotional response triggered by a perceived threat, marked by an acute alarm reaction that engages the organism via physiological changes, such as a rapid heart rate and a general sense of readiness to act. Therefore, fear is a short-term response to an immediate and identifiable threat, whereas anxiety is a prolonged reaction to an ambiguous danger (APA, 2013).

Four elements—anxiety provocation, physiological responses, cognitive reactions, and behavioural responses—interact to create and sustain a detrimental cycle of worry, fear, anxiety, and/or panic (McMahon & Boeldt, 2021). Fear involves a cognitive evaluation of a perceived threat, whereas anxiety is the emotional reaction to that evaluation (Beck & Emery, 2017). On a cognitive level, anxiety is related to future events, whereas fear is associated with perceptions of risk (Hooley et al., 2021). At the

physiological level, anxiety leads to a state of stress and excessive tension, which causes sweating to begin and the heartbeat to quicken (Sah, 2017). Furthermore, at the behavioural level, anxiety results in a general avoidance, whereas fear triggers the fight-or-flight response (First, 2013).

The sympathetic nervous system activates the fight-or-flight reflex when we experience anxiety in response to a genuine danger, and this reaction serves a crucial survival objective. Anxiety disorders are characterised by a heightened response to imagined threats, even in the absence of actual risk (Kring et al., 2019). The Global Burden of Disease (GBD) study indicated that in 2010, anxiety disorders impacted 26.8 million individuals globally (Whiteford et al., 2013). Anxiety disorders are common in many different demographic groups worldwide, according to Remes and colleagues (2016).

Anxiety disorders display gender-related variations. Anxiety disorders were the most common mental health issues among women. Women are also more likely to have anxiety disorders (Kessler et al., 2005). Moreover, anxiety disorders are also closely associated with the age factor. Anxiety disorders typically begin in early childhood, around the age of eleven (Kessler et al., 2005). The early development of the disease indicates its importance. Anxiety symptoms before the disease create chronic psychopathology that persists after the illness (Sawyer et al., 2010). There are adaptive parts of anxiety that help us, such as the ability to think ahead and prepare for potential dangers (Kring et al., 2019). Thus, a healthy amount of anxiety keeps us alive and awake, but chronic anxiety, disturbed quality of life, or disturbed daily routine are the obvious indicators of an anxiety disorder.

2.2. Definition, Historical Background, and Clinical Presentation of Phobias

Phobias are identified as a specific form of fear. The word "fear" originates from the Greek term "phobos," which encompasses meanings such as terror, flying, panic-fear, and fear of the enemy (Marks, 2013). Phobias are unreasonable and persistent worries about a particular event, activity, or object that cause severe avoidance and anxiety (Colman, 2001). In other words, emotional response, inappropriate participation, and

tension towards a specific and identifiable perceived danger come together to form fears (Rachman, 1998).

In specific phobia, unlike normal fear, there is an excessive and unreasonable terror of a specific object or scenario, but there is still an intense effort to avoid it (Kring et al., 2019). It can often be difficult to distinguish between fear and phobia because people with and without phobias may be properly avoiding specific dangers. The fear of flying can be more easily diagnosed in irrational cases, such as in people who have never been on an aeroplane before. However, the anxiety is reasonable for someone who fears flying in heavy turbulence. Therefore, phobic individuals' worries have a basis in fact. There is a wide range of the fear spectrum, from a mild fear to a phobia that causes extreme avoidance (Beck & Emery, 2017).

Specific phobias are typically triggered by phobic stimuli instantaneously and cause extreme fear, anxiety, or avoidance of the fearful items or circumstances. This condition does not demonstrate a specific cognitive pattern, in contrast to other anxiety disorders (American Psychiatric Association, 2013). When individuals with phobias compare themselves with other people, they become aware that their reaction to the phobic situation is excessive and irrational (Marks, 2013). Individuals frequently have several distinct phobias. On average, people with a specific phobia fear three or more object situations, and about 75% of them fear more than one object situation (American Psychiatric Association, 2013).

According to the DSM-5, the diagnostic criteria for specific phobias are outlined as follows (American Psychiatric Association-APA, 2013):

a. Marked fear or anxiety about a specific object or situation (e.g., flying, heights, animals, receiving an injection, seeing blood). Note: In children, the fear or anxiety may be expressed by crying, tantrums, freezing, or clinging
b. The phobic object or situation almost always provokes immediate fear or anxiety
c. The phobic object or situation is actively avoided or endured with intense fear or anxiety
d. The fear or anxiety is out of proportion to the actual danger posed by the specific object or situation and to the sociocultural context

e. The fear, anxiety, or avoidance is persistent, typically lasting for 6 months or more
f. The fear, anxiety, or avoidance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning
g. The disturbance is not better explained by the symptoms of another mental disorder, including fear, anxiety, and avoidance of situations associated with panic-like symptoms or other incapacitating symptoms (as in agoraphobia); objects or situations related to obsessions (as in obsessive-compulsive disorder); reminders of traumatic events (as in posttraumatic stress disorder); separation from home or attachment figures (as in separation anxiety disorder); or social situations (as in social anxiety disorder).

Three main categories of phobias were defined according to DSM-5, which are specific phobia, social phobia, and agoraphobia (American Psychiatric Association, 2013). Given their relevance to the subject, specific phobias are discussed in detail here. Specific phobias come in a variety of forms, including those related to (American Psychiatric Association, 2013):

a. animals (such as spiders, dogs, snakes, insects),
b. the natural environment, including water, thunder, height,
c. blood injection and injuries (have an injection, see blood, have medical care, get injured),
d. situations such as aircraft, tunnels, elevators, enclosed places, and other issues (vomiting, drowning).

2.3. Epidemiology of Phobias

The anticipated 12-month population prevalence of a specific phobia in the United States varies between 7% and 9%. Although anticipated prevalence rates are frequently lower in Latin American, Asian, and African countries (2%-4%), they are typically comparable to those in European nations (about 6%) (American Psychiatric Association, 2013). Initially, females are more frequently affected than males at a ratio of approximately 2:1; however, the rates vary depending on the specific feared stimuli. For example, while blood-injection-injury fear affects both genders equally, phobias related to animals, nature, and particular scenarios are predominantly experienced by

women. The age-of-onset distributions for specific phobias have very low ranges (4–7 years) and very high peaks (7 years). The interquartile range is the number of years between the 25th and 75th percentile ranks of the age-of-onset (4–7 years) (Kessler et al., 2005). Because of its early onset, specific phobia is frequently the primary clinical condition underlying other diseases. Specific phobias are often linked with a wide range of mental health issues, including major depressive disorder in older people (American Psychiatric Association, 2013).

Situational-specific phobias typically start later than natural environment, animal, or injury-injection-blood phobias, according to the American Psychiatric Association (2013). Some fears may develop during childhood, while others emerge during puberty. However, for most people, phobias that continue until adulthood are unlikely to go away. Specific phobias are less common in older people. However, it is still one of the more common diseases in adulthood. Various mental health disorders, including personality disorders (particularly dependent personality disorder), somatic disorders, substance-associated disorders, depressive and bipolar disorders, anxiety disorders, and others, are more common in clients with specific phobias (American Psychiatric Association, 2013).

2.4. Etiological Theories of Phobias

Different theories explain the aetiology of phobias. This thesis focuses on CBT and EMDR-based interventions, providing a detailed discussion of the relevant concepts associated with these therapeutic approaches. The main etiological explanations are reviewed below: the theory of classical conditioning (Rachman, 1977; Watson & Rayner, 1920), vicarious learning (Askew & Field, 2007; Mineka & Cook, 1989), the theory of preparedness for fear acquisition (Seligman, 1970, 1971), genetic factors (Kendler et al., 1999; Lichtenstein & Annas, 2000), personality traits and neuroticism (Biederman, et al., 1990; Ollendick, et al., 2002), cognitive models (Armfield, 2006; Kring, et al., 2019), and integrative approaches (Oakes, & Bor, 2010a, 2010b) to specific phobias.

2.4.1. Theory of Classical Conditioning

Behavioural theory explains the basis of anxiety disorders with classical conditioning (Kring et al., 2019). Studies with the conditional acquisition of fear date back to the famous Little Albert study by Watson and Rayner (1920), which was the first laboratory study of conditioned emotional responses in humans. This study demonstrates that Watson conditioned Albert to fear a rat by associating it with a loud noise, subsequently generalising his fear to other furry animals, including rabbits and dogs (Davey, 2019). The original theory proposed by Watson and Rayner (1920) posits that phobia is a severe conditioned response of fear that emerges whenever an unconditioned stimulus is associated with a traumatic experience.

Pavlov, Watson, and Rayner primarily influenced Mowrer's theory, and his contributions to the field have benefited substantially from the successful study of experimental psychopathology (Feather, 1963). Mowrer defines the two-factor model as a powerful function that provides relief by reinforcing safety behaviours that motivate individuals and enable us to avoid pain. (Rachman, 1977). Mowrer (1947) identifies instrumental learning or conditioning, proposing that fear motivation manifests in two stages according to his theory:

a. A person can learn fear with classical conditioning. In other words, fear is learned because of matching the fear-painful unconditioned stimulus with the neutral stimulus, that is, the unconditioned stimulus.
b. The person reduces his fear by avoiding fear, that is, by operant conditioning, so that the avoidance response is reinforced, and the avoidance behaviour becomes permanent (Mowrer, 1947).

In 1960, Mowrer revised his theory to emphasise the role of acquired emotions. Mowrer's focus on emotional conditioning of responses highlights that conditioned fear and hope serve as the foundation for both punishment and reward behaviours (Feather, 1963). A significant criticism of the traditional theory is that fear can be acquired not only through classical conditioning but also by observing others' fear. Bandura and Rosenthal (1966) suggest that individuals may acquire fear vicariously by observing another's fear of a specific object, animal, or situation. Therefore, the

traditional theory was inadequate in explaining the acquisition of fear through observation (Mineka & Zinbard, 1996).

Another shortcoming of early conditioning theories is their oversight of the lack of classical conditioning history (Mineka & Zinbard, 2006). Traditional conditioning theories are unable to explain why numerous people who experience traumatic experiences do not develop phobias (Rachman, 1990). Bandura and Rosenthal (1966) claimed that, unlike direct classical conditioning, in which the subject cannot alter the number of unpleasant stimuli provided, vicarious conditioning scenarios allow one to easily engage in response-interference strategies intended to reduce vicariously induced emotional reactions. Furthermore, early classical conditioning theories overlook human experiences by generalising their sterilised laboratory environment, which involves animals or a few people, to daily life (Mineka & Zinbarg, 2006). Early theory does not explain how personal experiences or invulnerability affect phobia vulnerability, level of impact, or phobia development (Mineka & Zinbarg, 1996).

2.4.2. Vicarious Learning

Rachman (1977) challenged the claim of classical conditioning theorists that fear can be learnt directly only. According to his theory, there are three main ways that fear can be acquired indirectly: the transfer of information, classical conditioning, and vicarious experiences. Vicarious learning and learning from dangers are two examples of indirect conditioning. Vicarious learning and awareness of verbal threats can elicit fearful responses to unfamiliar items or situations (Rachman, 1977). Similarly, Merkelbach and colleagues (1996) suggested that vicarious learning underpins the acquisition of human fear. People can learn about their fears by witnessing others' reactions to terrifying stimuli, and they argue that direct conditioning is an inadequate alternative to observational learning.

According to Bandura’s Social Theory of Learning (1969), social learning is formed by exposure to observing an individual's reactions, and observational learning is vital for forming social behaviour. The famous Bobo Doll experiment by Bandura highlighted that children learn aggressive behaviours vicariously, imitating both aggressive and other behaviours in response to like-sexed adults (Bandura et al., 1961).

Furthermore, Bandura (1969) asserted that the social environment plays a crucial role in the development of human fear; thus, relying entirely on trial-and-error methods or response shaping may lead to significant mistaken assumptions. People are more likely to acquire responses by observing their representational and cognitive forms.

Experimental research in primates (Mineka & Cook, 1993), children (Askew & Field, 2007; Askew et al., 2013), and adults (Olsson & Phelps, 2004) provides the scientific foundation for observational learning. Earlier experimental studies on monkeys provided intriguing evidence for vicarious learning. Several studies with rhesus monkeys were conducted to demonstrate vicarious learning of fears. The results indicated that rhesus monkeys without a fear of snakes can quickly acquire a permanent fear of snakes by observing the fearful reactions of other rhesus monkeys (Cook & Mineka, 1989; Mineka & Cook, 1986, 1993).

A series of experimental studies conducted by Askew and his colleagues demonstrated the effectiveness of vicarious learning in childhood (Askew & Field, 2007; Askew et al., 2008, 2013). Results indicated that observing others' fearful faces promotes fear cognitions in children, and that fear beliefs increase when they view pictures of scared adult faces. Therefore, they prefer to avoid these frightening stimuli over unpaired stimuli (Askew et al., 2008). The results of the experiments demonstrated that fear can be acquired by observing adults (Askew et al., 2013).

Researchers have also conducted various studies to investigate the effectiveness of observational learning in adults for the acquisition of fear. An experimental study by Olsson and Phelps (2004) was designed to demonstrate fear acquisition relative to direct Pavlovian conditioning, indirect vicarious conditioning, or verbally instructed learning. Three types of reactions to conditioned stimuli were demonstrated: masked and unmasked. The direct conditioning method learnt the fear response by administering mild shocks to the test subjects; however, the indirect vicarious technique taught the fear response by observing other groups that received paired shocks. All groups exhibit similar levels of fear to unmasked stimuli (Olsson & Phelps, 2004).

Considering the findings of these studies, conducted with primates, children, and adults, vicarious learning plays a crucial role in fear acquisition. Taken as a whole, the results presented here suggest that, in both direct and indirect ways, vicarious learning makes a significant contribution to the development of aviophobia (Oakes & Bor, 2010). Through this kind of learning, individuals may experience the same fear by observing the fearful reactions of others without having experienced a traumatic incident themselves (Bandura, 1969; Merckelbach et al., 1996; Askew & Field, 2007). Indeed, Bandura's social learning theory (1969) illustrates how observational learning expands an individual's behavioural repertoire. Parallel to this theoretical framework, Merckelbach and colleagues (1996) showed that watching other people's anxiety reactions plays an important role in the development of phobias. Thus, observing others' fear reactions or exposure to harmful media content related to aviation may promote aviophobia. The findings support the idea that vicarious learning is a key mechanism in aviophobia.

2.4.3. Theory of Preparedness of Fear Acquisition

The principles of learning have developed since the eras of Pavlov and Thorndike, utilising arbitrary event combinations, such as the association of a bell sound with food for dogs or a bar click with flour granules for rats (Seligman, 1971). Seligman proposed the theory of preparedness of fear acquisition as an alternative to the classical conditioning theory (Merckelbach & De Jong, 1997). According to the evolutionary preparedness perspective, phobic fear results from an interaction between aversive conditioning and evolution (Merckelbach et al., 1996).

The theory of learning suggests that humans have a biological predisposition to develop specific phobias, including fear of the dark and snakes (Merckelbach et al., 1996). According to the basis of this, every conditioned stimulus (CS) that is paired to a traumatic experience should lead to a phobia. In fact, there are restricted to a limited number of non-arbitrary things, such as fear of darkness, agoraphobia, and specific animal phobias (Seligman, 1970, 1971). Humans are highly susceptible to acquiring phobias, similar to other highly prepared associations. Phobias are non-cognitive and selective. Moreover, even very little input can be sufficient to learn phobias, and they persist despite extinction attempts (Seligman, 1970). This theory aimed to explain the

prevalence of specific kinds of phobias, like snakes or darkness, from the biological readiness aspect of learning fears (Merckelbach et al., 1996).

This hypothesis has been investigated in several human and animal studies. Öhman (Öhman, 1986) conducted several studies with normal individuals to test the preparedness of learning towards evolutionarily associated stimuli, such as spiders, versus evolutionarily irrelevant stimuli, like flowers. Researchers combined these stimuli with an electrical shock as a condition of unpleasantness (UC). After several experiments, it was demonstrated that conditioned reactions of participants to evolutionarily associated stimuli are more resistant to extinction following the acquisition of fear, in contrast to an evolutionarily irrelevant stimulus (Öhman, 1986).

Similar research results were repeated in non-human primates. A series of studies conducted with rhesus monkeys by Mineka and her colleagues indicated that after observing other monkeys' fearful reactions towards snakes, monkeys can learn to resist snake fear very quickly. On the contrary, observing severe fear reactions towards flowers did not cause flower phobia in monkeys (Mineka, 1987; Mineka & Cook, 1986, 1993).

Research on children has shown that fear-related observational learning is a key component in the development of fear-related cognitions and avoidance behaviours (Askew & Field, 2007, 2008; Askew et al., 2008, 2013). Contrary to the evolutionary perspective of the preparedness hypothesis, learning fear was identical for fear of snakes and worms or fear of flowers and marsupials (Askew et al., 2013). The results suggested that fear acquisition is not related to fear-relevant stimuli in early childhood. Moreover, experiments with adults demonstrated similar results (Olsson & Phelps, 2004). In conclusion, the preparedness theory is superseded by vicarious learning, where individuals acquire fear and avoidance by observing others (Askew et al., 2013).

2.4.4. The Theory of Inhibitory Learning

The comprehensive framework provided by inhibitory learning theory facilitates the ideas underlying CBT exposure therapy. Therapists can improve the success of

treatment for phobias and anxiety disorders by focusing on the formation and development of new safe memories (Pittig et al., 2015). The concept of inhibitory learning to acquire phobias represents a paradigm shift in our understanding and treatment of anxiety disorders, which places more emphasis on creating new, non-fearful associations than on simply decreasing fear reactions through habituation (Friedberg et al., 2024). Under this theory, the key to successful exposure therapy is to disrupt the individual's danger expectations. This results in inhibitory learning, which means learning to deal with fear instead of eliminating it (Sauer & Witthöft, 2022). Unlike the traditional habituation model, which focuses on desensitisation of fear responses, inhibitory learning theory posits that effective therapy requires sustained or increased interaction with the fear stimulus, as evidenced by consistent or elevated amygdala activation during exposure. This participation promotes the development of inhibitory associations that mitigate the original fear memory, resulting in improved clinical outcomes (Lor et al., 2023).

Furthermore, according to the theory of fear conditioning, a threat is associated with a neutral stimulus, which elicits a conditioned fear response. Through extinction, the repeated exposure to the feared stimulus without the unpleasant result creates a new "safe memory" that competes with the original fear memory (Rescorla, 2001). According to this theory, extinction—the decrease of fear reactions during exposure therapy—does not entirely erase the original fear memory but instead generates a new, competing memory that blocks the fear response (Bouton, 2004). There are various techniques to improve exposure treatment, such as breaking expectations, deepening extinction, and using multiple contexts, which support the theory. These methods help the brain learn these new associations more quickly (Pittig et al., 2015). Additionally, the theory recognises that individual differences, such as behavioural inhibition, play a role in how fear is acquired and in the duration and strength of fear reactions (Reynolds et al., 2018).

Overall, inhibitory learning theory offers a practical framework for understanding and addressing phobias, emphasising the development of fear tolerance and the formation of new, non-threatening associations (Lebois et al., 2019; Myers et al., 2007). According to inhibitive learning theory, in CBT, new safety memories must compete with and suppress old fear memories to overcome maladaptive fear reactions. Virtual

Reality Therapy (VRET) assists with this process in situations such as aviophobia by allowing for controlled exposure and the reconsolidation of fear memories (Rothbaum et al., 2006). Therefore, inhibitory learning is important in the development of fear of flying because it permits non-threatening events to compete with fear networks (Craske & Mystkowski, 2006).

2.4.5. Genetic and Biological Factors

Research indicates that genetic factors are equally influential as environmental structures in the development of phobias (Kendler et al., 1999). Lichtenstein and Annas (2000) conducted a large-scale twin study involving 1,106 subjects aged 8 to 9 years to assess the relative contributions of environmental and genetic risk factors in the development of phobias, specifically situational or animal fears. The research findings indicate that environmental factors, such as indirect learning, misinformation, and traumatic experiences, alongside hereditary factors, significantly influence the development of phobias in children. The estimated heritability for various psychiatric disorders and phobias is moderate, ranging from 30% to 40%, which is significantly lower than that of bipolar disorder or schizophrenia. Most of the variation in responsibility is primarily attributed to environmental variables (Merckelbach et al., 1996).

Genes play a significant role in this family aggregation for phobias; thus, inheritance is the leading cause of familial risk for phobias, as validated by twin studies (Hettema et al., 2001). While most people believe that genetics plays a significant role in the development of phobias, Czajkowski and his colleagues (2011) identified a phenomenon that contradicts this perspective. They designed another twin study with 1430 female twin subjects to investigate the relative roles of hereditary and environmental factors in phobias. Czajkowski et al. (2011) deviated from previous twin studies by emphasising that environmental factors have a larger influence on fear acquisition than genetic predispositions. According to their findings, fear responses may be determined more by individual learning experiences (such as conditioning and observational learning) than by genetic factors.

The point of Czajkowski and colleagues (2011). The view differs from traditional twin studies, which frequently indicated greater genetic concordance for phobic disorders. The study indicated that distinct environmental factors, rather than common genetic predispositions, play an important role in the development of various phobias. Czajkowski et al. (2011) showed that fear acquisition processes are more closely linked to situational and acquired experiences than to innate biological characteristics by examining the structure of phobia risk factors, especially in women. In conclusion, genetic studies suggest that the genetic contribution to specific phobias is substantial, consistent with the relevant literature. However, both environmental and genetic factors contribute to the acquisition of phobias in humans.

2.4.6. Personality Traits and Neuroticism

Neuroticism reflects the frequency, intensity, and stress associated with unpleasant emotions, as well as feelings of uncontrollability regarding upcoming problems and low self-efficacy in coping. Thus, neuroticism is associated with high levels of avoidance behaviours (Barlow et al., 2013). Using biological structure and temperamental characteristics to explain individual behavioural differences is a common strategy (Kagan et al., 1987). Literature examining the underlying causes of specific fears indicates that genetic factors exhibit a general characteristic. Ollendick and colleagues (2002) suggest that genetic factors should be understood as the inheritance of certain neurotic traits rather than the direct inheritance of fear. Thus, in the exploration of genetic factors, it is essential to account for the child's temperament, which plays a significant role in the acquisition and persistence of phobias.

Biological factors and temperament features are common approaches to explain individual differences in behaviours. Introversion and extraversion, along with shyness and sociability, are the two most significant temperament traits, encompassing attitudes towards unknown situations or strangers (Ollendick et al., 2002). Broadly, the sympathetic system activates as part of the autonomic nervous system under stressful conditions, and physiological symptoms include increased blood pressure, higher and more stable heart rates, and lower heart rate variability (Kagan et al., 1987). Inhibited children who display avoidance and withdrawal behaviours have more

reactive sympathetic activation, which affects cardiovascular functionality (Ollendick et al., 2002).

Several studies have been conducted to investigate the relationship between neuroticism and depression. Brown and Rosellini (2011) examined the direct and interactional influences of stressful life events and neurotic features on the intensity and recuperation of depressive symptoms. The study analysed 826 patients diagnosed with anxiety or mood disorders over follow-up periods of 6 and 12 months. According to the results, neuroticism and chronic-episodic stress were both strongly correlated with the intensity of depressive symptoms. Additionally, a significant interaction effect was observed, with neuroticism's impact on depression severity increasing as chronic stress increased (Brown & Rosellini, 2011).

Anxiety-related issues in childhood may have long-term impacts on personality features (Biederman et al., 1990). Similarly, Ollendick and colleagues (2002) discovered that anxiety is more common among persons exhibiting elevated neuroticism, indicating that personality structure significantly influences anxiety susceptibility. Therefore, the association between anxiety and personality characteristics, especially the neuroticism component, is a significant influence in the onset and persistence of anxiety (Biederman et al., 1990; Ollendick et al., 2002). Several studies have investigated the effects of personality structure on individuals, with a specific focus on shy children and infants. A study with children found that shy children exhibited a lower activation threshold, particularly when hypothalamic and amygdala levels were compared in response to new stimuli. These children exhibited sympathetic arousal in response to new situations (Kagan et al., 1987).

2.4.7. Cognitive Models

Cognitive factors play a significant role in understanding the acquisition of fear. Three basic concepts can be highlighted to conceptualise specific phobias and fears: Perception of danger, perceived control, disgust and unpredictability (Armfield, 2006). Firstly, the perception of danger is a cognitive assessment of an individual's response to a situation or stimulus as threatening or harmful, and it plays an important role in the development of phobias by increasing

fear responses and reinforcing avoidance behaviours (Craske et al., 2012). The perception of danger was examined through a meta-analysis encompassing 172 experimental studies. The research examined threat-related bias across various experimental contexts, revealing that individuals from distinct anxious groups exhibited increased attention to threat-associated situations (Bar-Haim et al., 2007).

Moreover, the concept of perceived control is a thinking style which includes thinking of having no control over the environment, and individuals who perceive no control are more prone to develop anxiety disorders compared to others (Kring et al., 2019). Perceived control refers to an individual's belief in their ability to influence or regulate events and outcomes in their environment. Low perceived control has been associated with greater vulnerability to phobias, as those who feel helpless when confronted with a threat are more prone to develop exaggerated fear responses (Mineka & Zinbarg, 2006).

The third important cognitive concept is disgust and unpredictability. Disgust is an emotional response to stimuli regarded as contaminated or disgusting, and it has been connected to the development of specific phobias by enhancing avoidance and anxiety reactions (Olatunji et al., 2007). It has been proposed that disgust, as well as its sensitivity to fear-related stimuli, plays a crucial role in fear acquisition through classical conditioning (Merckelbach, 1996). Several experimental studies on disgust sensitivity have demonstrated that typically feared small animals, such as mice, snakes, and spiders, elicit disgust rather than a perception of danger (Davey, 1994). Unpredictability, or the inability to anticipate or control events, can exacerbate anxiety and contribute to the development of phobias by making circumstances appear more dangerous (Grupe & Nitschke, 2013). This concept, closely related to uncertainty, describes the lack of information regarding the identity, possible movements, or location of the stimulus (Armfield, 2006). Anxiety disorders are characterised by an individual's inability to anticipate or prepare for potential dangers, which leads to increased anxiety levels (Grupe & Nitschke, 2013). A critical role of unpredictability has been shown for the development and maintenance of PTSD, especially for both human and animal subjects (Mineka & Zinbard).

A schema is one of the most basic concepts in cognitive psychology. Individuals modulate the perception of fear-related stimuli and can associate them with their own vulnerability (Beck & Haigh, 2014). When an individual encounters a stimulus, the vulnerability schema becomes active, and a holistic, general perception of vulnerability forms in relation to that stimulus. Thus, we do not require any conscious knowledge of that stimulus to react to it (Armfield, 2006). According to Armfield (2006), the vulnerability schema comprises individual differences, including personality factors and stimulus-related learning experiences. After the vulnerability schema is triggered, automatic emotional responses to fear occur first, followed by relatively slower cognitive processes. Thus, other cognitive factors, such as memory bias, autonomic questioning, anxious self-expressions, attention bias, and attention, become involved and increase the severity of the response to the stimulus (Beck & Haigh, 2014). The response to the stimulus can be emotional, cognitive, physiological, or behavioural, and the vulnerability schema is re-evaluated cognitively according to the individual's interpretation of the outcome (Armfield, 2006), as seen in Figure 1.

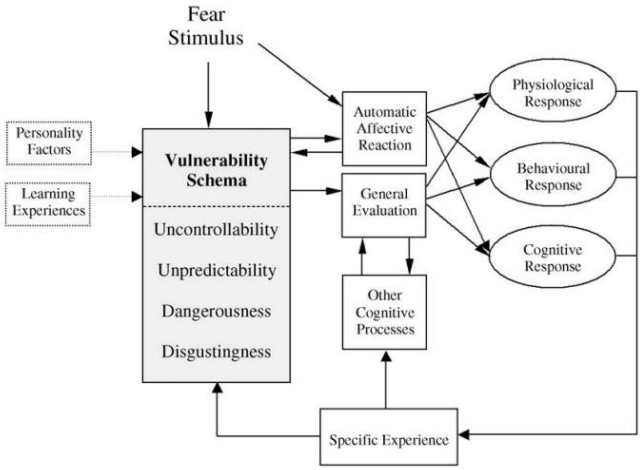


Figure 2.1. The Cognitive Vulnerability Model for Aetiology of Fears by Armfield (2006)

2.4.8. Integrative Etiological Framework: Aviophobia

While literature highlights several etiological factors contributing to the development of phobia, the explanation of fear acquisition from a singular perspective fails to account for the complex nature of aviophobia adequately. For this reason, it is essential to highlight the significance of a holistic approach that integrates social context,

learning history, and physiology, as illustrated in the first level of Figure 2 (Oakes & Bor, 2010).

The etiological factors that predispose an individual to develop a fear of flying are influenced by the cognitive vulnerabilities and psychological characteristics outlined in the second level of Figure 2. The fear developed through biological, sociological, and psychological interactions leads individuals to exhibit a wide variety of fear and phobia responses. These responses emerge as cognitive, behavioural, and physiological responses, as illustrated in the third level of Figure 2.2 (Oakes & Bor, 2010).

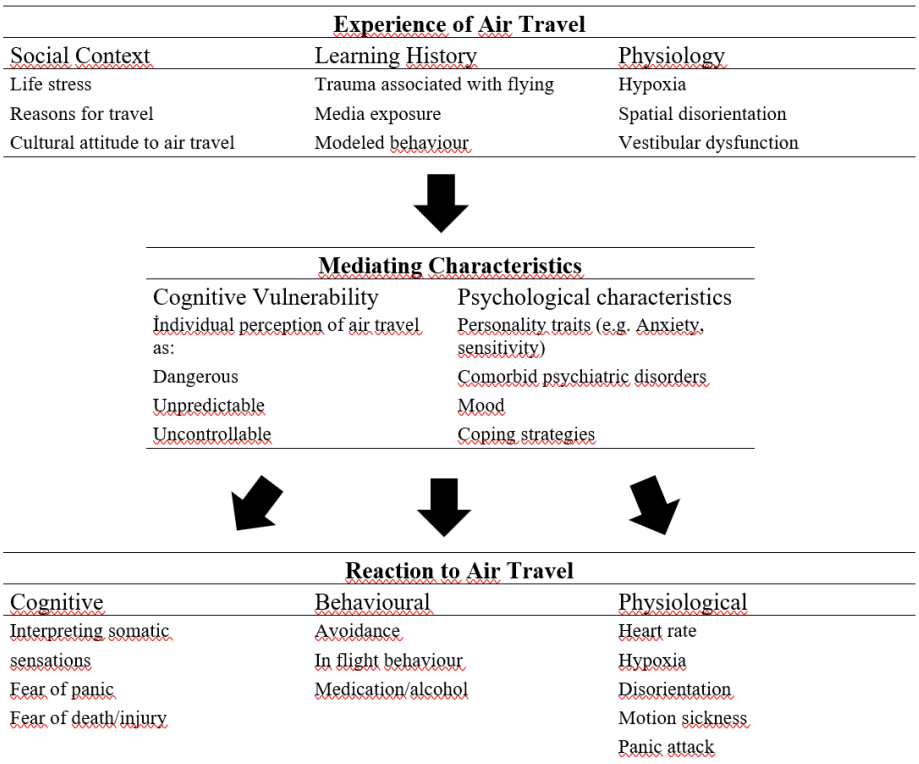


Figure 2.2. Aetiology of Flying Fear by Oakes and Bor (2010)

Several scientific studies have been conducted to determine the etiological factors underlying the acquisition of fear. In all, it would be inadequate to clarify aviophobia with a single etiological explanation. The present study employs a comprehensive approach regarding aviophobia, as demonstrated by Oakes and Bor (2010). Several

etiological factors might contribute to aviophobia development, including conditioned learning, traumatic events, genetic predisposition, schemas, cognitive vulnerability, and personality traits. The effectiveness of each component depends on individual differences. As a result, depending on the degree of their responses, individuals may show a wide range of fear and avoidance reactions on the moderate fear-phobia continuum.

2.5. Aviophobia

Aviophobia, also known as aerophobia, or flight phobia, is categorised in the DSM-5 as a version of anxiety disorder, specifically within the situational-specific phobias category (American Psychiatric Association, 2013). Below, the definition and clinical characteristics, prevalence, impacts, and therapeutic interventions for aviaphobia will be discussed.

2.5.1. Definition and Clinical Characteristics of Aviophobia

Aviophobia, also known as aerophobia, or flight phobia, is categorised in the DSM-5 as a type of anxiety disorder, specifically within the situational-specific phobias category (American Psychiatric Association, 2013). Aviophobia is a well-known and prevalent specific phobia characterised by a great fear of flying, which causes avoidance and significant distress or impairment in daily life (Abuso et al., 2025). Individuals experience severe fear, anxiety, or panic when thinking about, anticipating or planning to fly. This may encompass anticipatory anxiety, negative thoughts, and physical symptoms (e.g., rapid pulse and sweating) (Wiederhold et al., 2014). Aviophobia causes many people to intentionally avoid flying, which can disrupt their employment, social activities, and daily lives. Although some may still be able to fly, it may be with great difficulty or with the use of coping mechanisms like medication or alcohol (van Gerwen et al., 2018). Problems with flying can stem from a variety of sources, including a phobia of heights, turbulence, losing control, or even panic attacks while in flight (Wiederhold et al., 2014).

The estimated prevalence of aviophobia varies significantly across studies, most likely because of variations in diagnostic criteria, measuring methodology, and geographic

locations. Current estimates indicate approximately 40% of individuals in industrialised nations experience aviophobia (Laker et al., 2024). More specifically, the aviophobia prevalence in Western European countries and North America is estimated to be between 10% and 35% (Oakes & Bor, 2010a), with regional variations perhaps due to cultural and methodological variances across research. According to empirical research, roughly 25% of individuals have clinically significant flight anxiety, with 10% entirely avoiding air travel, severely limiting their daily functioning and mobility (Braga et al., 2017).

The gender disparity in fear levels may be related to broader psychological variables, since women generally report greater anxiety ratings in a variety of settings (Laker et al., 2024). Aviophobia is very common, especially among women. Studies show that about 60% of women have some amount of flight anxiety, compared to 33% of men (Ekeberg et al., 1989).

Aviophobia can have a critical impact on the life of an individual, including the ability to function in daily life. For individuals with aviophobia, air travel is a significant obstacle. The consequences of this fear are far-reaching; it can restrict business activities, negatively affect entertainment opportunities, deteriorate social relationships with family members, limit holiday plans, and cause economic loss due to spending extra money on alternative travel options (van Gerwen et al., 1997). Professionally, individuals with a fear of flying may avoid duties or programmes such as seminars, meetings, and conferences that require travel. This avoidance can lead to various business issues, including hindering career advancement and causing problems with administrators (Bor, 2017).

Aviophobia can significantly limit holiday or visiting plans involving family or friends, thereby hampering social relations with family members (Skolnick et al., 2012). This condition can significantly impact both social and familial dynamics. Several possible consequences can arise, such as long-term marital relationship problems and issues during family vacations if individuals are unwilling to travel. In some cases, family conflicts due to flight phobia can lead to severe marital problems or even divorce, seriously impairing the person's quality of life (Bor, 2017). Additionally, this problem may restrict an individual's freedom. Avoiding flying may

hamper relationships due to missing important events that require travel, such as weddings, graduation ceremonies, or funerals.

Individuals with aviophobia may prefer different travel solutions, like driving, train travel, or cruising, instead of flying for these reasons. These individuals may avoid travelling by aeroplane, and alternative travel options cause them to lose time and travel with effort. Individuals with aviophobia can spend extra money on alternative travel methods, like car travel. Furthermore, some individuals with aviophobia continue to fly despite their fears. However, this situation creates intense fear and anxiety. In many cases, worry and anxiety begin to arise immediately when individuals realise they are going to fly. Additionally, extreme distress can be triggered not only by the act of flying itself but also by going to the airport, hearing an aeroplane engine, seeing an aircraft, or even discussing flying (Botella et al., 2004). Thus, they focus on flying the whole time, which causes constant stress and worry and keeps them from concentrating on their work or enjoying the trip.

Individuals' personal relationships can be affected when they are unable to fully engage in society and enjoy life to its fullest potential (Nousi et al., 2008). Additionally, research discovered that aviophobia is linked with work-related psychological issues, particularly burnout. The findings suggest that individuals who are burnt out may also be more likely to fear flying (Laker et al., 2024). This loss not only limits business and social life at the individual level but also leads to revenue losses for airline companies, reduced occupancy rates, and decreased customer loyalty. Given the increased global mobility and growth targets in the aviation industry, the need to address aviophobia with effective, rapid, and accessible methods is more critical than ever.

Aviophobia is strongly associated with increased stress levels. Additional effects on mental health might result from the worsening of stress-related symptoms, which in response can be associated with traumatic experiences in the past (Laker et al., 2024). Since flying is an uncomfortable experience for people with aviophobia, they participate less in social activities such as holidays, business trips, and family gatherings that require flying. Thus, aviophobia's effects on the aviation industry may harm the economy by reducing travel and associated sectors (Oakes & Bor, 2010a).

Concerns about flying are also associated with mental health issues that arise from the job, such as burnout. The stress caused by a fear of flying may lead to reduced work performance, resulting in significant limitations for individuals who frequently travel for work (Laker et al., 2024).

Aviophobia is not a distinctive issue but rather is associated with several psychological issues and stress-related illnesses (Laker et al., 2024). It is a multifaceted disorder marked by a combination of diverse phobias, including fear of accidents, claustrophobia, acrophobia, fear of losing control, fear of water, fear of darkness, agoraphobia, and social anxiety (van Gerwen et al., 1997). There is a wide range of anxiety symptoms, as shown in the reviewed literature (Oakes & Bor, 2010b). Cognitive, behavioural, and physiological factors are the three primary aetiological factors in flying fear (Triscari et al., 2015). The cognitive responses associated with aviophobia consist of the misinterpretation of somatic symptoms, apprehension regarding death, and concerns about social shame or loss of self-control. Behavioural responses consist of avoidance and the intake of alcohol or medication, whilst physiological responses include elevated blood pressure and heart rate, hyperventilation, motion sickness, and panic attacks (Oakes & Bor, 2010a).

2.5.2. Therapeutic Interventions for Aviophobia

Since the Wright brothers first demonstrated controlled flight in 1903, many people have been both fascinated by and fearful of flying. With the expansion of flights to civilian areas, millions of passengers were transported across the world in remarkably short time (Oakes & Bor, 2010a). Nevertheless, this technological innovation, which simplifies life, is becoming inaccessible to individuals with aviophobia, resulting in numerous disadvantages, including social and economic ones. Aviophobia brings relational, professional, social, and economic problems and limitations for phobic individuals. It is a diverse form of anxiety that includes a range of behavioural, physiological, and cognitive reactions to flying (Oakes & Bor, 2010). Moreover, it is a combination of several phobic reasons, including social anxiety, fear of an accident, fear of darkness, claustrophobia, loss of control, need for control, acrophobia, agoraphobia and fear of water (van Gerwen et al., 1997).

In the 1950s, psychotherapy began to flourish, but with the acceleration of cognitive and behavioural therapies, studies on aviophobia intensified in the 1990s (Oakes & Bor, 2010). For instance, a randomised controlled trial (RCT) study demonstrated that a fully automated, self-administered mobile VR-CBT program used at home dramatically reduced flying anxiety and avoidance among aviophobics. This treatment is effective, scalable, and accessible, avoiding therapy's traditional issues (Donker et al., 2023). Similarly, a quantitative meta-analysis indicates that VRET effectively reduces fear and anxiety, also offering enduring relief for aviophobia (Cardoş et al., 2017). Despite numerous publications on aviophobia, the field of aviation psychology, especially in Türkiye, remains in its developmental stages. The scarcity of research in this area in Türkiye suggests that it requires further exploration and understanding. Given the limited number of studies available, this study is expected to make a significant contribution to the advancement of aviation psychology, providing valuable insights and fostering growth in this emerging field.

An examination of the literature from the last ten years demonstrates that VR-assisted exposure therapies are effective in treating aviophobia (Carl et al., 2019). Nevertheless, several significant limitations exist in many ongoing studies: Firstly, the majority of research has primarily concentrated on multi-session interventions, while single-session and fast-acting approaches have received insufficient attention (Öst et al., 1997; Schleider & Weisz, 2017). Furthermore, although online therapy has dramatically increased the accessibility and availability of psychotherapy after COVID-19, there are also several limitations. Beyond access and availability issues, such as the loss of therapeutic control and barriers for patients with limited technology access or skills, online therapy presents communication challenges due to the absence of nonverbal cues, difficulties in developing therapeutic relationships, and issues with professional boundaries (Stoll et al., 2020). Despite these shortcomings, online therapy is a safe and supportive space for clients to cope with stress when applied correctly (Wiederhold, 2018). It provides significant benefits to clients, including increased accessibility, convenience, cost-effectiveness, and anonymity, while demonstrating outcomes comparable to those of face-to-face psychotherapy (Andersson et al., 2014).

Two hundred and twelve different aviophobia treatments around the world and airline programs used to cope with aviophobia. The fundamental elements of these programs

include information about flight and therapeutic flight. The programs include various elements, such as information on aviation and anxiety, relaxation strategies, cognitive restructuring, simulator exposure, therapeutic flight, and re-prevention (Gerwen & Wolfger, 2004). Interventions targeting aviophobia are notable for their multi-faceted composition.Various programs employing methods such as psychoeducation, cognitive restructuring, relaxation training, anxiety management, and exposure have been examined in the literature (Van Gerwen et al., 1999). A crucial element enhancing the efficacy of these programs is CBT, which enables individuals to confront their fear responses in a safe and secure setting (Rothbaum et al., 2000).

In a similar vein, this research focuses on exposure strategies developed within the context of CBT. CBT's success in aviophobia stems from its capacity to help patients rebuild their malfunctioning cognitions and diminish avoidance behaviours (Öst, 1989). Traditionally, exposure has taken place in actual flying. However, in this research, the exposure component will be executed utilising VR technology because of its capacity to provide augmented reality and a controlled setting. VRET demonstrates comparable efficacy to traditional approaches, while presenting benefits in terms of simplicity of implementation, cost-efficiency, and standardisation (Rothbaum et al., 2000).

2.5.2.1. Pharmacological Interventions

Pharmacological treatments can be beneficial in the management of aviophobia, particularly for individuals with severe symptoms or coexisting mental health conditions. Pharmacological treatment in aviophobia is generally used to suppress anxiety, avoidance and physiological reactions towards flying (Günther et al., 2002). According to Günther and colleagues (2022), a variety of pharmaceutical interventions are available to modulate the autonomic response to phobic scenarios, including benzodiazepines, antidepressants, and beta-blockers.

While pharmacological intervention offers several short-term advantages for aviophobia, it is accompanied by numerous limitations. A significant amount of research demonstrates that the combination of psychotherapy with medications provides significant advantages. Patients who received both SSRIs and CBT had

greater remission rates than those who received either treatment alone (Dunlop et al., 2019). Moreover, the combination of psychopharmacologic treatment and gradual exposure therapy effectively addressed a case of aviophobia, resulting in enhanced quality of life and reduced functional limitations for the patient (Abuso et al., 2023). Therefore, intervention techniques should be customised according to the individual's needs. Recent scientific research has demonstrated that psychotherapy approaches, particularly CBT, produce more long-term and effective benefits than pharmacological treatments. For example, studies indicated that CBT not only reduced anxiety symptoms but also dramatically reduced flight-related avoidance behaviours over time (McEvoy et al., 2017). Additionally, CBT therapies aided by VR had a lower relapse rate than those aided by medication (Wiederhold & Wiederhold, 2019).

In the literature, the medical treatment of phobias has attracted little attention. There is little evidence demonstrating that benzodiazepines could be helpful in acute conditions. For example, medication may help a person with aviophobia to fly at that moment; however, anxiety reappears when the medication is discontinued (Choy et al., 2007). Furthermore, benzodiazepines and selective serotonin reuptake inhibitors (SSRIs) can assist with aviophobia symptoms in the short-term, but prolonged use is associated with serious side effects like dependence, memory loss, sexual problems, and higher anxiety levels (Hollon et al., 2014; Fredrikson et al., 2020). Furthermore, prolonged use of pharmacological interventions can impair fear extinction mechanisms, thereby affecting overall treatment outcome (Fredrikson et al., 2020; McEvoy et al., 2017). Moreover, beta-blockers, such as propranolol, provide an alternative by addressing physiological symptoms such as elevated heart rate, but they do not treat the psychological components of aviophobia (Aviation Health, 2024).

Selective serotonin reuptake inhibitors (SSRIs), like escitalopram, have demonstrated efficacy for long-term treatment, especially for those with persistent flight anxiety. However, this intervention typically takes several weeks to take effect, and it may have side effects initially (Johnson & Lee, 2023). These limitations highlight the importance of integrating medical and psychological treatments. Additionally, two RCTs examining the effects of pharmacological intervention when combined with VRET and yohimbine hydrochloride (YOH) (Meyerbröker et al., 2012; 2018) or propranolol

(Meyerbröker et al., 2018) indicated that pharmacology did not demonstrate greater efficacy in promoting fear extinction relative to either placebo or VRET alone.

Although pharmacological treatments (for example, benzodiazepines or beta-blockers) are known to provide short-term symptom relief, it has been stated that medications do not provide long-term solutions due to their addictive potential, side effects, and failure to address underlying cognitive distortions (Fredrikson et al., 2020). Similarly, current evidence indicates that pharmacotherapy provides effective symptom management; however, cognitive-behavioural therapy (CBT) yields better long-term outcomes and lower relapse rates (World Health Organisation, 2023). In this respect, scientific research suggests that psychotherapy techniques should be the first choice for persons who want to overcome aviophobia permanently.

In conclusion, psychotherapy in the treatment of aviophobia is more effective in numerous respects than pharmacological interventions, as previously described. This evidence points us in the direction of psychotherapy as the first line of treatment for aviophobia. Pharmacological treatment may be considered to assist the psychotherapy process if the psychotherapy is ineffective or the client is not appropriate for the psychotherapy.

2.5.2.2. Desensitisation and Exposure Therapies

This section will examine exposure and desensitisation techniques, including systematic and imaginal exposure, in vivo exposure, and interoceptive exposure, respectively.

2.5.2.2.1. Systematic Desensitisation and Imaginal Exposure

Systematic desensitisation is a practical behavioural therapy technique for decreasing fear and anxiety in various situations. According to Wolpe (1963), this method involves teaching clients relaxation techniques while exposing them to potential anxiety triggers in a controlled environment. Individuals' phobic reactions may decrease through relaxation and then exposure to anticipated situations (Wolpe, 1963). The initial phase of systematic desensitisation involves developing a fear hierarchy,

which ranks flight-related situations by the level of anxiety they elicit. Individuals with aviophobia may experience anxiety at various stages, ranging from thinking about flight to the actual process of boarding an aircraft (Triscari et al., 2015; 2011). Systematic desensitisation reduces anxiety and improves coping methods. Systematically confronting fears helps individuals feel in control of their anxiety, which may enhance their confidence when facing future anxiety-provoking events (Wolpe, 1963). Individuals who fear flying can significantly benefit from this empowerment, as it can help them develop a more positive outlook on air travel and decrease their avoidance behaviours (Triscari et al., 2011).

Imaginal exposure therapy is another known component of CBT that entails the repetitive visualisation and presentation of anxiety-inducing or traumatic events in detail. It is mainly employed when direct (in vivo) exposure to feared stimuli is impractical, as in cases of trauma, severe phobia, or logistical limitations (Kaur et al., 2016). Experiencing a traumatic memory or fear in a structured, therapeutic setting allows people to process their feelings about it, which can lead to habituation and less avoidance behaviours over time (Tarrier et al., 2018).

Imaginal exposure deliberately activates the fear memory through detailed and prolonged visualisation, incorporating sensory details, emotional content, and cognitive appraisals of the feared situation. This frequent encounter makes fear extinction and a reorganisation of related maladaptive beliefs possible (Kaur et al., 2016). Imaginal exposure works exceptionally well for treating PTSD, specific fears, and obsessive-compulsive disorder (Tarrier et al., 2018). A study compared the effectiveness of Virtual Reality Graded Exposure Therapy (VRGET) with Standard Only Imagery Exposure Therapy in people afraid of flying. Throughout the exposure series, individuals in all three scenarios were physiologically and subjectively aroused to a comparable extent. Even though only 20% of imaging participants flew during the 8-week treatment period, 80% of VRGET subjects receiving no physiologic output and 100% of VRGET patients receiving physiological output were able to fly without medication (Wiederhold et al., 2001).

Although both imaginal exposure and systematic desensitisation have proven to be successful treatments for anxiety disorders, they have several drawbacks. Although

systematic desensitisation is effective with specific phobias, it might not address the underlying emotional and cognitive causes of anxiety, which could lead to a recurrence of symptoms (Smith & Jones, 2020). A further obstacle to therapeutic effectiveness may be the progressive nature of systematic desensitisation, which can be time-consuming and necessitate a high level of patient and therapist commitment (Keller et al., 2021). Imaginal exposure, while beneficial, is strongly dependent on the individual's ability to vividly imagine unpleasant circumstances, which may not be effective for all individuals (Miller et al., 2019). Its efficacy may also be reduced if therapists mistakenly use cognitive restructuring or distraction techniques instead (Roberts & Williams, 2018). Furthermore, the impact of imaginal exposure on actual avoidance behaviours may be limited because it does not involve direct exposure to fearful stimuli (Johnson & Patel, 2020). Additionally, VR therapy is more realistic than imaginary exposure, as all the senses are activated during the exposure, allowing for a faster desensitisation process (Wiederhold et al., 2002). Sense of immersion was investigated as an important individual-difference concept in this study. It is known that people can immerse themselves in virtual environments to varying degrees.

VRET therapies have been developed as an alternative to traditional systematic desensitisation and imaginal exposure methods. A systematic review comparing VRET and traditional therapy techniques demonstrated that VRET reduce symptoms of fear of flying substantially. It indicated comparable efficacy to traditional cognitive behavioural therapy and in vivo exposure therapies. Additionally, the authors observed that VRET was associated with increased treatment acceptability and decreased dropout rates, which further supports its practicality in clinical contexts (Cardoş et al., 2023). Wiederhold and colleagues (2001) conducted a study on aviophobia to compare the effectiveness of the VRGET and the standard imagery alone exposure therapy. The results indicated that participants across all three conditions experienced comparable levels of physical and subjective stimulation during the exposure series. However, several clients are unable to identify anxiety in an imagined phobic environment and are unable to re-experience the phobic stimuli through exposure. Consequently, modifying the fear pattern is challenging because it is in a passive state (Wiederhold et al., 2002).

In conclusion, although these traditional techniques have significantly contributed to anxiety treatment, their limits emphasise the necessity for inventive approaches. Technological innovations, such as VRET and internet-based interventions, present intriguing options that can improve treatment success by offering immersive, regulated exposure environments, thereby overcoming certain limitations of systematic desensitisation and imaginal exposure.

2.5.2.2.2. In-Vivo Exposure Therapy

In vivo exposure therapy was assessed as one of the most effective psychological interventions to reduce aviophobia and decrease cognitive responses and somatic symptoms related to flying. In vivo exposure is a customised therapy strategy based on a practical evaluation of a client's history of anxiety, problems, and the psychological state (Oakes & Bor, 2010b). Several strategies have been applied alone or integrated with in vivo exposure, such as restructuring cognitions, relaxation or the interoceptive exposure technique (Antony & Barlow, 1998). In vivo exposure entails the patient encountering actual phobic stimuli, such as boarding or experiencing turbulence, in the context of aviophobia. This is typically achieved in a substantial context, starting with the lowest anxiety-inducing element of the stimulus and progressing to its most anxiety-inducing component.

In vivo exposure therapy is a cornerstone in managing the symptoms of specific phobias, such as aviophobia. It allows for the confrontation of the feared stimuli, which leads to the habituation and extinction of fear reactions by immersing patients in anxiety-inducing real-life situations. In vivo exposure often involves real flights or simulated boarding experiences for individuals with aviophobia, providing them with actual exposure to cues associated with flying. This method has been effective in diminishing anticipatory anxiety and avoidance behaviours related to flying (Mühlberger et al., 2003).

Although in vivo exposure is highly effective, it is subject to several constraints. Firstly, actual flight experiences can be costly and logistically challenging, especially for patients with extreme anxiety or those living in places with restricted access to air travel (Mühlberger et al., 2003). Moreover, it is a costly technique and challenging to

adapt to every flight situation (Rothbaum et al., 2006). Furthermore, individuals may find the intensity of real-life exposure excessive, which could lead to greater distress or treatment dropout (Mühlberger et al., 2003). Moreover, the absence of privacy, loss of controllability, and increased therapy duration are other limitations of the in vivo technique. Sometimes, individuals find in vivo exposure therapy to be "extremely realistic" when contemplating treatment (Wiederhold et al., 2002). The availability of qualified therapists and the requirement for prolonged therapy sessions may create additional substantial temporal and financial strains on clients (Mühlberger et al., 2003).

VRET appears to be an intriguing option to in vivo exposure. To facilitate repeated, graduated exposure without the practical limitations of actual flights, VRET provides regulated, customisable exposure scenarios in a virtual environment (Maples-Keller et al., 2017). Studies have demonstrated that VRET can be as effective as in vivo exposure in reducing aviophobia symptoms, with the added benefits of greater accessibility and patient preference (Maples-Keller et al., 2017). Similarly, research provides support for the effectiveness of a one-session VR exposure therapy for aviophobia over a follow-up of 6 months. Clients in the VRET treatment confirmed a greater decrease in anxiety and fear related to flying than the control group members given information about flying fear or the group given information about single-session cognitive therapy. The results confirmed that VR exposure therapy has a significant role for single-session VRET (Mühlberger et al., 2003).

Although in vivo exposure therapy is still the gold standard for treating aviophobia, its limitations highlight the necessity of using various techniques. VRET is a realistic and practical option, especially for individuals who are unable to receive traditional exposure due to logistical or financial constraints. Future studies and technical developments will improve these therapeutic approaches even further, which could improve treatment results for people with aviophobia.

2.5.2.2.3. Interoceptive Exposure

Interoceptive exposure is a cognitive-behavioural strategy that involves intentionally creating physical feelings associated with anxiety in a controlled setting. This

contributes to the reduction and confrontation of individuals' anxiety responses (Craske, 2017). It is a functional behavioural treatment technique that helps clients cope with anxiety and distress caused by physical sensations. Interoceptive exposure treatment is widely used for panic disorder, anxiety sensitivity, PTSD, social anxiety disorder, physical disorders and specific phobias (Boettcher et al., 2016). Interoceptive exposure is especially beneficial for treating panic disorder because it breaks the "fear of fear" cycle by allowing patients to frequently experience anxiety-provoking physiological sensations (e.g., elevated heart rate or dizziness), which leads to a decrease in anxiety sensitivity (Craske, 2017).

Interoceptive exposure method reduces avoidance behaviours and increases tolerance to anxiety by enabling the habituation of distressing physiological responses (Barlow et al., 2014). This technique may mimic flight-related symptoms, such as heart palpitations or shortness of breath, which are commonly experienced during flight. According to research, interoceptive exposure can effectively reduce aviophobia by treating the physiological components of anxiety, allowing patients to tolerate unpleasant symptoms and decreasing their fear of flying (Craske, 2017).

The diaphragmatic breathing method is part of the exposure therapy used for several treatment methods for phobias. However, it is debated whether it is a distraction or a facilitating coping strategy to overcome phobias. Shiban and colleagues (2017) conducted a study to examine the effectiveness of diaphragmatic breathing as a relaxation technique and coping strategy for flying phobia during VRET. Findings indicated that utilising diaphragmatic breathing as a supplement to VRET may result in greater decreases in flying fear compared to VRET alone.

There are several restrictions to interoceptive exposure, notwithstanding its usefulness. The treatment involves patients purposefully producing unpleasant bodily sensations, which some people may find difficult to tolerate (Craske, 2017). Furthermore, it focuses on the physiological elements of anxiety and may not adequately address the cognitive and environmental factors that lead to anxiety disorders, including aviophobia (Barlow et al., 2014). These restrictions indicate that this technique alone may not be adequate for many clients, particularly those whose anxiety is exacerbated by cognitive distortions or avoidance behaviours (Craske, 2017). Integration with

other therapeutic techniques, such as VRET, offers physiological and situational exposure to feared stimuli (Rothbaum et al., 2017).

In conclusion, while interoceptive exposure is an effective tool for treating anxiety disorders, including aviophobia, its limits underscore the need for other techniques. VRET offers a possible alternative that enables immersive, controlled exposure to fearful stimuli, potentially overcoming some of the limitations of interoceptive exposure. Future research should investigate the integration of different techniques with interoceptive exposure to maximise treatment outcomes for people with aviophobia.

2.5.2.3. Cognitive Behavioural Therapy (CBT)

CBT is a problem-solving therapy technique that supports clients to overcome life challenges, including emotional distress, through more functional behavioural and cognitive strategies. The therapy includes a combination of both cognitive and behavioural interventions (Clark & Beck, 2010). According to research on cognitive therapy and neuroimaging, symptom reduction in CBT is associated with changes in brain areas involved in the development and regulation of negative emotions (Gotlib & Joormann, 2010). CBT has been shown to enhance symptomatic adjustment by addressing malfunctioning information processing impairments associated with depression and anxiety (Clark & Beck, 2010).

Phobogenic stimulation, such as exposure to spider videos for arachnophobia, elicits fear and anxiety that correlate with increased cerebral blood flow in the visual association cortex and decreased blood flow in the hippocampus, orbitofrontal cortex, posterior cingulate cortex, prefrontal cortex, and temporal cortex among individuals with specific phobias (Fredrikson et al., 1995). Recent research has shown that psychological interventions aimed at modifying individuals' symptoms and maladaptive behaviours may facilitate cognitive-level transformations in the brain, particularly concerning conditions such as phobias, depression, obsessive-compulsive disorder (OCD), and panic disorder. The evidence so far points out that those psychological treatments, such as CBT, can alter activation in dysfunctional neural

circuits linked to the emergence of various psychopathological conditions (Kumari, 2006).

CBT has been demonstrated as an effective treatment for aviophobia. Techniques such as cognitive restructuring, systematic desensitisation, and guided dialogues are employed in CBT to help individuals reframe their fears and gradually confront them (Peristianto & Astuti, 2022). CBT promotes coping mechanisms and anxiety management techniques (Anderson et al., 2006). Busscher and Spinhoven (2016) conducted a longitudinal study with participants with aviophobia to observe how cognitive coping is effective for the CBT mechanism. Researchers looked at the association between changes in coping style and decreases in anxiety and avoidance behaviour in a group of people with a fear of flying during therapy and a 3-year follow-up. The results showed that a decrease in dysfunctional cognitive coping strategies and an increase in healthy coping strategies were strongly related to changes in flight anxiety and flying behaviour. In particular, cognitive coping techniques did not predict long-term results at baseline for maladaptive threat appraisal and catastrophic thinking related to flight. However, changes in them during therapy predicted 3-year gains. These findings highlight the need to focus on cognitive coping mechanisms in CBT for aviophobia to gain long-term therapeutic benefits (Busscher & Spinhoven, 2016).

CBT and cognitive-behavioural training have considerably reduced subjective anxiety related to phobia (Krijn et al., 2007). Cognitive restructuring helps people reframe negative perceptions of flying, minimise anxiety and decrease avoidance behaviours associated with flying (Triscari et al., 2015). Additionally, cognitive restructuring involves identifying and challenging irrational thoughts related to flying. The CBT intervention helps respondents reframe their unjustified worries, improving their comfort and behaviours around phobic triggers.

Exposure therapy is a type of anxiety intervention method that includes exposing the client to the stimuli that cause anxiety. CBT exposure therapy provides a decrease in anxiety through exposing the client to the stimuli that evoke anxiety. Those stimuli are produced using a variety of techniques, including imaginary exposure (in which the client imagines the stimulation) and in vivo exposure (in which the client faces the stimulus and is exposed to realistic situations) (Wiederhold et al., 2002). Exposure

therapy often involves gradual exposure to flying stimuli in addition to cognitive restructuring (Wiederhold & Wiederhold, 2003). Systematic desensitisation helps clients to deal with phobic stimuli gradually (Peristianto & Astuti, 2022). This therapeutic method is based on CBT principles and aims to help individuals systematically and effectively confront their fears. The primary objective of exposure therapy is to reduce the anxiety response to feared stimuli through a process known as extinction, in which the conditioned fear response diminishes over time as individuals confront their fears without the anticipated negative consequences (Boeldt et al., 2019; Shiban, 2018). Additionally, exposure therapy is often integrated with other therapeutic methods to enhance its effectiveness. Integrating mindfulness practices or relaxation techniques during exposure sessions can enhance patients' ability to manage anxiety effectively (Shiban et al., 2017).

CBT has been extensively examined as an effective treatment for aviophobia in adults (Triscari et al., 2015; Ribé-Viñes et al., 2023). It can reduce flight-related anxiety and avoidance behaviours, and these effects are sustained at follow-up (Ribé-Viñes et al., 2023). Despite its established efficacy, CBT for aviophobia has several limitations, such as significant dropout rates, high costs, and low ecological validity (because imaginal exposures may not adequately simulate the sensory signals of an actual flight) (Triscari et al., 2015). Additionally, the availability of qualified therapists, technological needs, and time limitations may limit access to CBT (Ribé-Viñes et al., 2023). However, VRET or internet-based CBT have shown comparable efficacy to traditional in-person CBT, providing persons with aviophobia with accessible and scalable treatment options (Triscari et al., 2015).

CBT is among the most prevalent and impressive therapy approaches for aviophobia. CBT provides a robust theoretical basis and serves as the gold standard. However, contemporary and functional approaches, such as VRET and internet-based CBT, offer alternatives in terms of accessibility and treatment sustainability. CBT is often integrated with other psychotherapy techniques, such as VRET and EMDR, enabling the development of individualised and multidimensional treatment protocols (Botella et al., 2017; Cardoş et al., 2023; Triscari et al., 2015). Thus, all individual factors should be considered before developing the treatment plan, and the plan should be tailored to the specific needs of clients with aviophobia.

2.5.3. Virtual Reality Therapy (VRET)

In recent years, as the world has rapidly evolved, virtual reality (VR) has begun to play a practical role in various aspects of our daily lives. The recent COVID-19 pandemic has particularly accelerated this virtual transformation, affecting fields ranging from medicine and art to education and business. Psychotherapy has been an integral part of this transformation, which began naturally decades ago. The following topics will be discussed under VRET: the development and historical background, technological components, clinical applications in anxiety disorders, VRET for specific phobias, VRET for aviophobia, VRET for social anxiety disorder (SAD), VRET for claustrophobia, VRET for panic disorder, and VRET for other applications.

2.5.3.1. Development and Historical Background

The nature of VR offers several innovative techniques and methods for a comprehensive understanding of individual emotional reactions and the human psyche. The ability to manipulate an artificial reality and then provide a structured set of information or challenges can, in theory, resemble traditional psychotherapy methodologies. The utilisation of virtual worlds may contribute to more creative and flexible approaches in therapeutic interventions for clients' issues (Wiederhold & Wiederhold, 1998).

The first clinical application of VRET to psychological disorders was conducted in Japan by Kijima (1994), who adapted the Sandbox game for children with autism. In the following years, another case study was conducted with children with autism using VR therapy as a learning tool, emphasising the importance of generalising VR to other clinical areas (Strickland et al., 1996). The case studies of children with autism were followed by a controlled height phobia study by Hodges and colleagues (1995); thus, VR therapy began to spread in other clinical areas.

Numerous studies have investigated the influence of VRET in treating aviophobia, with encouraging findings. According to systematic reviews and meta-analyses, VRET is as successful as standard treatments, such as CBT, in reducing anxiety related to flying (Cardoş et al., 2017; Ribé-Viñes et al., 2023). Research indicates that VRET

significantly decreases anxiety, fear, and avoidance behaviours associated with flying (Botella et al., 2004; Muhlberger et al., 2006; Rothbaum et al., 2006).

VRET entails the progressive desensitisation of individuals to fear-inducing stimuli in a simulated environment, to ensure psychological safety. A recent systematic analysis revealed that VRET considerably lowers aviophobia symptoms, with efficacy comparable to traditional CBT and in-vivo exposure (Cardoş et al., 2023). Similarly, studies have demonstrated that clients' anxiety levels significantly decreased, and they reported an increase in their flying activity, from 0.04 to 0.16 flights per month with VRET (Gottlieb et al., 2021). VRET addresses not only immediate fears, but also anticipatory anxiety related to flying. Personalised scenarios, including airport and aeroplane environments, enhance the therapeutic experience (Baños et al., 2002).

2.5.3.2. Technological Components

Virtual Reality (VR) technology has emerged as a cutting-edge tool in mental health care, providing immersive environments for exposure therapy. The great majority of research employs head-mounted displays to provide immersive, three-dimensional worlds (Opriş et al., 2012; Rothbaum et al., 2002). VRET utilises immersive VR technology, specialised software, tracking devices, and user interfaces, with the addition of gamification and data analytics enhancing its benefits (Krjin et al., 2004). VRET is becoming an increasingly accessible, scalable, and adaptable treatment option for anxiety and related disorders because of these technological components. These systems monitor head movements and give multimodal information, giving the user a strong sense of presence and immersion, as in the current study (Maples-Keller et al., 2017).

A comprehensive study and meta-analysis sought to assess the efficacy of VR applications in the management of anxiety disorders. The review analysed randomised controlled trials (RCTs) that compared VR apps with conventional therapy or with waiting-list controls. In total, 17 studies were analysed, and head-mounted displays were utilised for VR applications in 16 studies. Results from VR applications have shown a positive effect in reducing anxiety symptoms (Schröder et al., 2023). VRET usually utilises head-mounted displays (HMDs) integrated with motion sensors

to present immersive flight simulations. To improve the authenticity of the exposure, specific configurations include vibration seats or environmental sound systems (Cardoş et al., 2023).

Modern VRET relies on consumer VR hardware platforms, such as the Oculus Rift and Samsung Gear, which deliver immersive visual and audio experiences. These platforms have made VRET more affordable and accessible for clinical and self-help purposes (Lindner et al., 2017).

Furthermore, specialised VRET software produces virtual environments for specific phobias or anxiety triggers. These applications enable individualised, progressive, and controlled exposure scenarios (Boeldt et al., 2019). Additionally, input and monitoring devices, such as hand controllers and eye-tracking technologies, enable virtual interaction and can monitor user responses to enable more precise therapeutic adjustments (Lindner et al., 2017). Using simple interfaces, therapists can regulate exposure progression, customise stimuli, and track patient responses. These interfaces are necessary for clinician-led and self-guided VRET (Boeldt et al., 2019).

2.5.3.3. Clinical Applications in Anxiety Disorders

Anxiety disorders represent one of the most extensive applications of VRET. VR-based therapy has several advantages, especially for anxiety disorders. The notion of exposure is the foundation of VR-based therapy for anxiety disorders, much as traditional methods. In vivo exposure is impractical, challenging, and possibly hazardous for certain illnesses (such as driving phobia). In contrast, it is expensive for others (such as aviophobia), and VRET may provide a reliable, affordable option (Gregg & Tarrier, 2007). The therapist controls and rearranges the environment, which is not dependent on airline schedules or safe flight conditions (Oakes & Bor, 2010). Additionally, VRET successfully integrates psychological, theoretical, and practical aspects in a modular, adaptable format (Gregg & Tarrier, 2007). It provides therapists with greater control overanxious situations, such as air turbulence and weather conditions. It enables them to tailor scenarios to each client, in contrast to in vivo therapy (Mühlberger et al., 2003). Moreover, compared to in vivo and imaginary exposure therapy, VRET provides privacy that is presented in the therapy room, and it

is possible to expose phobic stimuli systematically. Clients can feel more comfortable at the beginning of treatment because the exposure is entirely under the control of both the client and the therapist.

Various scientific experiments, meta-analytic studies and systematic reviews have given proof about the effectiveness of VRET for diverse diagnostic situations (e.g., anxiety disorders, stress-related disorders, psychosis, eating disorders, and health conditions) since the first studies in the 1990s (Botella et al., 2017). The following are the most common disorders for which VRET has been utilised as a treatment approach: specific phobias, aviophobia, social anxiety, claustrophobia, panic disorder, and other applications.

VRET is being utilised more frequently as an intervention for phobias. Research indicates that this technique is effective in reducing phobia symptoms and is frequently comparable in efficacy to traditional in vivo exposure therapy. VRET significantly reduces phobia and anxiety symptoms compared to waiting or placebo controls, with effect sizes ranging from modest to large across distinct phobias (Carl et al., 2019). The effectiveness of VRET in the treatment of phobias, particularly exposure therapy, has proven very impressive (Miloff et al., 2019). Exposure therapy seems to be the evidence-based "gold standard" intervention for these anxiety disorders; however, because of its aversive nature, sometimes clients cannot accept it, and they reject exposure. VRET is an effective intervention technique that can generate a solution to this difficulty by increasing clients' acceptability and offering flexibility by controlling the conditions under which exposure therapy might be insufficient (Botella et al., 2017).

VRET is efficacious for several phobias, and gains from VRET persist through follow-ups for up to 12 months, indicating lasting effects (Miloff et al., 2019). Types of phobias, such as aviophobia (Meyerbröker & Emmelkamp, 2022), acrophobia (Parsons & Rizzo, 2008), arachnophobia, claustrophobia (Opriş et al., 2012), fear of driving (Costa et al., 2018), agoraphobia (Fodor et al., 2018), fear of falling (Giotakos et. al., 2007), slight animal phobia (Suso-Ribera et al., 2019), etc., have been studied frequently with VRET. It is a compelling method for treating phobias (Dellazizzo et al., 2020).

VRET has developed as an evidence-based treatment for aviophobia in recent years. Research indicates that VRET yields outcomes that are either equivalent to or superior to those of standard in vivo exposure therapy (Carl et al., 2021). The therapeutic efficacy of VRET is related to two key mechanisms: progressive exposure in a controlled virtual environment and cognitive reorganisation. Advances in digital technology enable VR, which offers a promising alternative for widespread in-vivo therapy. The client is exposed to a fear and anxiety-eliciting virtual condition. A computer-based VR environment incorporates sensory input and behavioural cues that evoke fear and anxiety, similar to in vivo exposure, and facilitates present-action VR stimulation (Mühlberger et al., 2001). The effectiveness of VRET in combination with various therapeutic methods was demonstrated in studies on exposure therapy, muscle relaxation, CBT, bibliotherapy, and group therapy (Price et al., 2008). VRET allows for systematic desensitisation to anxiety triggers by providing safe and realistic flight-related simulations (e.g., cabin confinement, turbulence) (Rothbaum et al., 2019). Additionally, VRET enables therapists to tailor exposure parameters, such as weather conditions and flight time, thereby improving treatment adaptation to individual demands (Eichenberg & Wolters, 2019).

Evidence-based studies of VRET in the treatment of aviophobia date back to the 1990s (daCosta et al., 2008). Although it is a well-accepted and functional method, it has been repeatedly tested under different protocols by various research groups over time, and it cannot be considered a definitive treatment protocol. The number of sessions, the protocol content, and the session duration vary across studies (Cardoş et al., 2017). The historical development of VRET studies in different research groups is discussed below.

First, a group of researchers, including Hodges and Rothbaum (1995), published the first controlled study on the treatment of psychological disorders with VRET. This study examined the treatment of arachnophobia and the VR environment's efficacy in enhancing the sense of presence, as demonstrated in the research. Findings indicated that one’s experience in the virtual world can influence their perception of the real world. Therefore, the study established a scientific basis for the use of VRET in the treatment of psychological disorders (Hodges et al., 1995). Then, in 1996, a group of researchers, including Rothbaum and Hodges, adapted VR therapy to aviophobia over

a case study and developed a VRET protocol. The findings suggested that VRET is effective in reducing aviophobia (Rothbaum et al., 1996).

Rothbaum and colleagues (1999) constituted a treatment manual for aviophobia with VET. They conducted a series of randomised controlled studies comparing the efficacy of the standard in vivo and VRET for aviophobia in 2000, 2002, and 2006. The results demonstrated that both methods were significantly efficient in treating aviophobia. The treatment's efficacy was maintained at the six-month, twelve-month, and twenty-four-month follow-ups (Rothbaum et al., 2000, 2002, 2006).

In Rothbaum and colleagues' 2002 study, VRET and classical exposure protocols were compared over eight sessions spanning six weeks. They replicated the VRET protocol developed by Rothbaum and Hodges in 1997. The first four sessions aimed to teach anxiety management skills, which include short breath training, thought stopping, cognitive restructuring, and exposure to hyperventilation (if a history of panic attacks). Sessions between five and eight include VR exposure scenarios, such as sitting on a plane, landing, takeoff, and turbulence. The passenger seat, equipped with a woofer, added vibration and noise and was accompanied by various sounds, including conversations among cabin crew members, engine noise, and weather conditions. Thus, it has been conclusively demonstrated that the VR method is as effective as classical exposure for aviophobia (Rothbaum et al., 2000). The findings showed that 92% of VR group participants, compared to 91% of the classical in vivo group participants, were able to fly at the end of one year, and the therapeutic gain was maintained.

Meanwhile, Rothbaum's team was conducting VR studies on aviophobia, and Klein was working on aviophobia with VR at the first private clinic in the United States, the “Phobia Centre” (Klein, 1998). Klein's aviophobia protocol is based on Rothbaum and Hodges’s unpublished VRET Therapist Manual for Flying Fear (Rothbaum et al., 1997), which includes pre-intervention, exposure, and post-intervention assessments. Clients were given relaxation and thought-stopping exercises between sessions 1 and 3, and they were asked to practice the techniques as homework. After the first session, clients were introduced to VR and experienced three different scenarios, each lasting approximately 20-25 minutes. Breathing and thought-stopping exercises continued

simultaneously in the VR. Six of the twelve flying-phobic clients have flown impressively after the treatment (Klein, 1998). This study was replicated again in a case study (Klein, 2000).

Wiederhold and colleagues are another important group of researchers from the Psychotherapy Centre at the California School of Professional Psychology in San Diego. They conducted a series of experimental studies on the treatment of aviophobia with VRET, and they specifically focused on the physiology of the fear responses during VR (Wiederhold et al., 1998; Wiederhold & Wiederhold, 1999; Wiederhold et al., 2001; Wiederhold et al., 2002; Wiederhold & Wiederhold, 2003). Wiederhold and colleagues (2001, 2002, 2003) employed various measurement variables, including SUDs (Subjective Unity of Scales), self-report techniques, observation of avoidance behaviour, and physiology. They observed the effectiveness of VRET, and relaxation techniques compared with relaxation and imaginal exposure in follow-ups at 3 and 36 months. The researchers' treatment protocol consisted of eight sessions. As the first session includes history-taking, teaching relaxation techniques, and forming individuals' fear hierarchy, the second session includes a review of breathing techniques with therapist-client interaction. Clients fulfil the self-report measurements in the third session. The remaining sessions, from the third to the eighth, focus on virtual reality exposure over the next six weeks. Each session includes 20 minutes of virtual or imaginal desensitisation, with SUDs assessed every 2 minutes. After three months, findings indicated a significant decline in SUDs and anxiety scores of the participants, and no significant difference was found between virtual or imaginary groups. Dramatic findings indicated that 100% of the VR group participants, whereas only 10% of the imaginary group, could fly at the three-month follow-up (Wiederhold et al., 2001, 2002, 2003).

In addition to the studies covered thus far, several researchers have investigated this topic. For instance, Kahan and colleagues conducted studies by integrating CBT and VRET (2000) and combining psychodynamic therapy and CBT in a VR environment (2000). At the post-treatment stage, 68% of the clients could fly, but they still experienced anxiety (Kahan et al., 2000). In the case study, the patient was able to fly with minimal anxiety (Kahan, 2000). Additionally, a study found clinically significant reductions in flight anxiety in 72% of subjects who received VRET, with effects lasting

6 months (Kahlon et al., 2021). Likewise, another study found that VRET enhanced participants' ability to adapt to real-flight situations while significantly reducing physiological indicators of anxiety, such as heart rate and cortisol levels (Meyerbröker & Emmelkamp, 2022).

Numerous empirical investigations have assessed the efficacy of VRET compared with various therapeutic approaches, including in vivo exposure, muscle relaxation, cognitive-behavioural therapy, bibliotherapy, and group therapy. In the treatment of specific phobias, Virtual Reality Exposure Therapy (VRET) has been the most extensively utilised and has received the most empirical scrutiny (Price et al., 2008). The results of the quantitative meta-analysis conducted by Roxana and colleagues (2017) indicated that VRET is as effective as classical exposure for the treatment of aviophobia. Additionally, research has indicated the long-term effectiveness of VRET in a 1-year follow-up (Botella et al., 2004). Compared with in vivo exposure, VRET allows the therapist to control the simulated environment. In VRET, the therapist may repeatedly present conditions such as turbulence, weather, take-off, and landing until the client's fear decreases. NO-FEAR Airlines is an internet-based aviophobia therapy program that uses a cost-effective, accessible self-help technique to overcome the limitations of in vivo exposure therapy (Campos et al., 2016). Regardless of the therapist's support, the NO-FEAR Airlines program was a successful treatment compared to a waiting list for reducing symptoms of aviophobia at 3- and 12-month follow-ups. Unlike other behavioural techniques, VRET comprises interactive VR rather than imagined or actual stimuli (Maltby et al., 2002).

Clients can be repeatedly exposed to fearful stimuli in a carefully controlled virtual environment. VRET for SAD (Social Anxiety Disorder) enables subjects to confront their social anxieties in a regulated setting. These virtual social scenarios and interactions target a variety of social concerns (e.g., speaking in front of an audience, chatting to a stranger). The effectiveness of the treatment was evaluated in terms of quality of life, SAD symptoms, and depressive symptoms (Hartanto et al., 2014).

VRET is a compelling intervention for claustrophobia, reducing anxiety and improving self-confidence (Botella et al., 2000). Studies indicate that VRET is a cost-effective method for treating this phobia (Freitas et al., 2021). A study involving four

individuals who underwent eight VRET sessions at a psychotherapy clinic demonstrated significant improvements, confirming the efficacy of VRET in treating claustrophobia (Botella et al., 2000). Another study with 44 participants (pre- and post-test) at Al-Zaytoonah University of Jordan examined VRET for claustrophobia using a Cave-based simulation over 4–6 sessions. One week after the intervention, significant reductions were observed in self-reported anxiety symptoms and physiological arousal (as measured by heart rate, oxygen saturation, and mean arterial pressure), and the participants considered VRET to be highly beneficial. These findings are consistent with existing evidence supporting VRET's efficacy in anxiety disorders, highlighting its potential for clinical use in understudied areas of claustrophobia (El-Qirem et al., 2024).

VR therapies continue to evolve and transform in line with technological advancements. Along with technological developments, VR therapies continue to develop and transform. One of the most recent examples of developing virtual reality technologies was carried out by Găină and colleagues in 2024. They have designed the SAFEVR ACT virtual reality therapy application to treat acrophobia and claustrophobia, offering a safe and effective alternative to traditional therapies. To sum up, VRET is an effective method for treating claustrophobia, offering the advantages of safe exposure therapy and cost efficiency. However, limitations include potential difficulties adapting to virtual environments and the need for technological equipment. These findings confirm VRET as a reliable treatment option for claustrophobia.

VRET effectively alleviates panic disorder and anxiety symptoms, is well-received by patients, and provides a cost-efficient, accessible alternative to conventional exposure therapies. In various meta-analyses, post-treatment results of VR-based therapies for panic attacks indicated large, significant effects in comparison with various control groups (Fodor et al., 2018; Opriş et al., 2012; Parsons & Rizzo, 2008). A RCT study evaluated the effectiveness of a self-guided, mobile app-based VR CBT for panic disorder. Participants using the VR app showed significant advancements in panic disorder symptoms, anxiety, and depression compared to a waitlist control group. The intervention included comprehensive CBT components and VR exposure, and its effectiveness was assessed through clinician-administered and self-reported measures,

as well as physiological data (heart rate variability). The results suggest that self-help VR CBT can be an efficacious treatment option for panic disorder (Shin et al., 2021).

Pelissolo and colleagues (2012) conducted a study comparing the effectiveness of VRET, CBT, and a waitlist control in treating panic disorder with agoraphobia. Ninety-two participants underwent twelve therapeutic sessions. The study found that VRET and CBT were equally effective in post-treatment evaluations. Follow-up assessments nine months later showed that therapeutic outcomes for both groups were maintained. The findings suggest that VRET is a successful intervention for panic disorder with agoraphobia, with both short-term and long-term outcomes comparable to those of CBT. In conclusion, VRET stands out as an efficacious method for treating panic disorder with agoraphobia. Both short-term and long-term results show that VRET is comparable to CBT. These findings confirm that VRET is a reliable treatment option for such phobias.

Recently, VRET has been popularly used in several clinical settings as a tool for social interaction, training skills (like public speaking anxiety, mindfulness, or anger management), learning how to respond (just like autism) appropriately, and a supporting tool for problem-solving (like for aggressive behaviour) (Meyerbröker, 2021) and mindfulness (Navarro-Haro et al., 2019). Moreover, VR therapy has been used to address transdiagnostic problems like poor emotion control (Meyerbröker, 2021), bullying (Ingram et al., 2019), and pain management (Keefe et al., 2012; Pourmand et al., 2018).

In the intervention of VRET, specific phobia, social anxiety disorder, claustrophobia and panic disorder have been discussed so far. Along with these disorders, there is a field of study where the persuasiveness of VR therapy has been studied in numerous disorders such as: PTSD (McLay et al., 2017; Rizzo et el., 2005); neurodevelopmental disorders (Strickland, 1997; Wang & Reid, 2011); obsessive-compulsive disorder (Javaherirenani et al., 2022; Kim et al., 2009); generalized anxiety disorders (Gorini et al., 2010; Repetto et al., 2013) and eating disorders (Koskina et al., 2013; Riva et al., 2004). VRET's compatibility with emerging technology offers significant advantages for both clients and therapists. Its use is expected to become widespread in other fields, making technology an indispensable tool in therapeutic processes.

2.5.4. Eye Movement Desensitization and Reprocessing Therapy (EMDR)

Francine Shapiro pioneered the Eye Movement Desensitisation and Reprocessing (EMDR) therapy for treating trauma-related diseases in 1995 and 2001, respectively (Shapiro et al., 2017). According to Shapiro (2017), EMDR is a scientifically supported psychotherapy method that employs an adaptive information processing model–based eight-stage procedure to facilitate emotional and cognitive recovery by addressing past trauma, present triggers, and future challenges.

EMDR treatment is a systematic psychotherapy approach that is most known for treating post-traumatic stress disorder (PTSD), as evidenced by many RCTs involving both adults and children (Jongh et al., 2024). EMDR allows for the reprocessing of maladaptive memories, addressing underlying emotional dysregulation and cognitive distortions that are ubiquitous across a variety of mental health problems (Shankar, 2023). According to recent research, EMDR is not only beneficial to PTSD but also shows promise in treating a variety of other diseases, including anxiety, depression, and substance use disorders. varying degrees of success (Abrebak et al., 2023). While some data suggest that EMDR can reduce symptoms in various disorders, further thorough study is needed to determine its persuasiveness across diverse groups and mental health issues (Shankar, 2023). EMDR has been studied as a technique to assist individuals with a range of mental health problems, containing anxiety disorders (Yunitri et al., 2020), depression (Carletto et al., 2017), eating disorders (Bloomgarden, & Calogero, 2008), obsessive-compulsive disorder (OCD) (Marsden et al., 2018), psychosis (van den Berg et al., 2013), pain (Tesarz et al., 2014), PTSD (Scelles & Bulnes, 2021), sexual dysfunction (Jebelli et al., 2018), and other mental health problems (Cuijpers et al., 2020).

The EMDR works with events associated with minor or major traumatic events related to fear (Newgent et al., 2006). A review of six randomised controlled trials (RCTs) investigated the efficacy of EMDR therapy for adults with anxiety disorders over 20 years (1997-2017). Four of the six RCTs that were analysed showed that EMDR therapy reduced symptoms associated with panic disorder and specific phobias, indicating that EMDR could prove beneficial to individuals who suffer from anxiety disorders (Faretta & Dal Farra, 2019). Several studies indicated the effectiveness of

EMDR therapy for phobias, for instance, McNeal (2001) applied fifty minutes of eight sessions to individuals with phobias, and they concluded that EMDR is an influential clinical intervention technique to overcome phobias. Similarly, three one-hour sessions were conducted to address aviophobia, and the results showed that EMDR was effective in reducing fear of flying, flight avoidance, and flying anxiety (Lapsekili & Yelboga, 2014).

Although CBT is the predominant approach for treating aviophobia, empirical studies on various psychotherapeutic methods are also beneficial in addressing this fear (Triscari et al., 2015). A review of the literature indicates that EMDR is one of the methods used in addition to VRET for aviophobia. Before clarifying the flash technique, it is essential to note that the practical uses of an evidence-based approach to EMDR therapy can be customised to address a wide range of mental health problems, thereby enhancing client outcomes (Gainer et al., 2020). Research on EMDR therapy for specific phobias suggests that it can provide significant advancements within a few sessions (Chan et al., 2025).

EMDR is a contemporary treatment predicated on the premise that traumatic events are retained in memory, with associated unpleasant emotions becoming entrenched in the body. These distressing memories prevent the individual from processing them during rapid eye movement events (Triscari et al., 2015). EMDR therapy is founded on the Adaptive Information Processing Model (AIP), which emphasises the inherent ability of individuals to progress towards wholeness and well-being (Shapiro, 1995). The AIP model contributes to EMDR therapy by giving a thorough understanding of how trauma impacts mental health, directing the therapeutic process, and ensuring that treatment is adapted to the experiences of persons with personality disorders (de Jongh et al., 2024). Furthermore, from the AIP perspective, negative attitudes, adverse emotional responses, and negative bodily sensations are merely manifestations rather than underlying causes of current issues (Oren & Solomon, 2012). Unprocessed memories of traumatic events are not entirely integrated into an individual's memory system, resulting in emotional suffering and potential mental health problems. Therefore, EMDR is a therapeutic approach that prioritises the recognition and resolution of these memories to assist individuals in the process of healing from their traumatic experiences (de Jongh et al., 2024).

The permanent modification of conditioned fear responses depends on memory reconsolidation, which is triggered by the retrieval of a fear memory and the emergence of a prediction error that challenges the original threat expectation (Pedreira et al., 2004; Sevenster et al., 2013). This discrepancy makes the memory flexible, allowing it to incorporate new, non-threatening information during a critical phase (Manfield et al., 2017). EMDR treatment directly activates this mechanism: retrieving a traumatic memory and experiencing bilateral stimulation (BLS) causes a crucial prediction mistake that contradicts the predicted threat response (Manfield et al., 2017). This mismatch makes the memory labile, enabling it to be updated, and subsequent reconsolidation permanently alters the original memory trace (Manfield et al., 2017). The long-term effectiveness of EMDR serves as clinical proof for this reconsolidation-based erasing.

Memory reconsolidation theory states that this alteration of the original memory is permanent after it has been reconsolidated (Manfield et al., 2017; Stickgold, 2002). Evidence of effective EMDR demonstrates that treatment achieves long-term change; it must meet both requirements. EMDR therapy facilitates direct engagement with the traumatic memory during the assessment and desensitisation stages, offering the client an experience that defies expectations. Throughout the EMDR session, the absence of reexperiencing significant influence, severe sensation of danger, or embarrassment, as well as the experience of recalling the memory with simultaneous bilateral stimulation (BLS), most likely comprises the necessary prediction error (Manfield et al., 2017).

2.5.5. The EMDR Flash Technique

The EMDR flash technique is a novel EMDR intervention technique that seeks to lessen anguish and suffering associated with traumatic memories quickly (Wong, 2019). This technique is still in its early stages of development. The potential mechanism for the observed quick impacts has sparked a variety of theories (Wong, 2021). The following topics will be discussed below: a historical overview, similarities between EMDR and the flash technique, differences between EMDR and the EMDR flash technique, and the unique advantages of the EMDR flash technique.

According to Manfield and colleagues (2017), the flash technique was designed for the standard EMDR protocol's preparation phase to reduce the severity of highly unpleasant memories through a painless approach. Although it is a very new technique, there are several studies which are indicating efficacy of the flash technique with (Manfield et al., 2017), homeless dissociative people (Wong, 2019), depression (İnci İzmir, & Akyol, 2024), PTSD symptoms in COVID-19 patients and mental health professionals during the pandemic (Manfield, et al., & 2021), test anxiety (Akyol, & İnci İzmir, 2025), single-session flash applications in trauma (Konuk, 2019), group application of flash technique for people living with PTSD of earthquake (Konuk, 2021). It has been shown by Brouwers and colleagues (2021) that the flash technique is as efficient a method as EMDR for clients suffering from trauma memories, with similar results to EMDR.

The model was developed utilising recently released fMRI data from VBE trials involving spider images for individuals with spider phobia. The model is grounded in fMRI evidence indicating abnormal brain connections in individuals with PTSD. Consequently, fMRI data from PTSD patients utilising the flash technique may serve to support this paradigm (Wong, 2021). Manfield and colleagues (2017) indicated that the goal of the flash technique intervention is to reduce the pain associated with a specific memory to the point where the client is no longer resistant to fully recovering and processing it with regular EMDR therapy. To mitigate the psychological impact of an unpleasant event, the communication must be sufficiently concise to prevent individuals from contemplating or contesting it. The EMDR flash technique appears to be most effective when the flash occurs so quickly that the client has no time to think about it or recall the memory clearly (Manfield et al., 2017).

Systematic desensitisation elicits a milder response, and the importance of the EMDR flash technique should be considered in this context (Choy et al., 2007). Clients can work with discomfort without having to face the painful memory. Manfield and his colleagues (2011) claimed that the flash technique can create new neural connections between the trauma memories network and memory networks associated with these new viewpoints, promoting restoration and possibly correcting cognitive distortions.

Multiple studies have validated the effectiveness of the EMDR flash technique, a modification of the traditional EMDR. The studies highlight its potential in alleviating trauma-related symptoms (Brouwers et al., 2021; Manfield et al., 2017; van Geusau et al., 2023). The EMDR flash technique, unlike EMDR, facilitates the processing of highly traumatic memories with minimal distress for clients. It reduces emotional intensity during preparation by enabling clients to access memories without fully recalling them (Manfield et al., 2017).

The EMDR flash technique has demonstrated efficacy in reducing anxiety, intrusive thoughts, avoidance behaviours, traumatic stress, and symptoms related to the mental quality of life among individuals involved in traffic accidents, as evidenced by a one-month follow-up study (Yasar et al., 2022). Similarly, another study assessed the efficacy of a 15-minute flash technique intervention on 654 subjects. Participants were instructed to recall a disturbing memory and engage in a structured flash technique experience. The results demonstrated a substantial decrease in disturbance levels, which was sustained or slightly enhanced at both the 4-week and 18-week follow-ups (Manfield et al., 2024). Wong (2019) conducted a study on five homeless dissociative patients, using the flash technique to help them process painful experiences without excessive emotions. The study found significant reductions in PTSD, depression, and dissociation scores after treatment. The results indicated that the EMDR flash technique was effective in decreasing participants' subjective distress related to traumas.

Yaşar and his colleagues (2021) conducted a randomised controlled trial to evaluate the efficacy of the EMDR flash technique in single-session group applications for clients with traumatic symptoms. The study found statistically significant differences in SUD and IES-R scores before, one week after, and four weeks after practising the EMDR flash technique. Additionally, there was a significant difference in PCL-5 scores between pre-session and post-session groups ($p<0.01$). Similarly, Manfield and colleagues (2021) conducted a study to evaluate the efficacy of the EMDR flash technique in reducing stress among healthcare providers caring for COVID-19 patients. The study involved 30 minutes of psycho-education and two 15-minute flash interventions, with distress levels measured before and after the treatment. Results

showed significant decreases in distressing memories post-intervention and at follow-up, with no negative consequences, indicating the effectiveness of the flash technique.

In conclusion, the EMDR flash technique has demonstrated significant efficacy in reducing distress associated with traumatic memories, making it a valuable tool in trauma-focused therapy. Its ability to minimise emotional overwhelm while processing traumatic content sets it apart from traditional methods. As we transition to the next section, we will explore similarities and differences between EMDR and the EMDR flash technique, advancements in the EMDR flash technique and its implications for clinical practice.

The EMDR flash technique and EMDR share numerous similarities throughout the entire intervention. The visible consequence of efficient EMDR and the flash technique shows that therapy achieves meaningful change. Both treatments offer complete access to the disturbing memory throughout the evaluation and desensitisation phases (Manfield et al., 2017). Firstly, as in EMDR therapy, the EMDR flash technique is also based on the Adaptive Information Processing (AIP) model (Stickgold, 2002). AIP is a term used to describe how information is processed in different ways, as the client continually assumes more of an observer perspective toward the traumatic memory. The adaptive adult viewpoint of clients starts with awareness, according to the AIP EMDR model of trauma treatment (Wong, 2019).

Secondly, both EMDR and the flash technique interventions focus on eye movements, and experimental research has demonstrated that eye movements reduce memory vividness and/or emotionality soon after treatment (Leer et al., 2014). Next, similar to the EMDR therapy, flash technique also provides decreased level of SUD (Subjective Units of Distress), the clarity and vitality of the traumatic memory is replaced by the image that recedes, fades, becomes black and white or fades, the clarity and vitality of the traumatic memory leaves its place to the distant and fading image (Yaşar et al., 2021). Brouwersand and colleagues (2021) found no difference between the EMDR and the EMDR flash technique in terms of the vividness of the disturbing memory from pre-test to post-test after treatment and one-week follow-up. The EMDR flash technique is a relatively new approach, similar to EMDR, and is based on the AIP trauma resolution model. The client is in the position of observer while working with

trauma repetitively, and the person gains awareness with a more functional adult perspective during the therapy process (Manfield et al., 2011). The main components of both EMDR and the EMDR flash technique involve maintaining attention on two distinct concepts: the traumatic memory and the bilateral stimulation attention mechanism (Navarro et al., 2018).

Another similarity between EMDR and the EMDR flash technique is that, during regular EMDR sessions, SUD provides basic information about the distressing intensity of a specific event or memory, allowing both the therapist and the client to evaluate therapeutic outcomes (Yaşar et al., 2021). Like EMDR therapy, the EMDR flash technique was found to be successful in reducing the degree of aversiveness associated with traumatic memories (Brouwers et al., 2021). Furthermore, there is growing scientific evidence that people's working memory struggles to hold a disturbing memory in mind while performing a dual task, such as making quick eye movements (de Jongh et al., 2013), which can make the distressing memory less vivid and emotional. Working memory theory may have been utilised to explain both EMDR therapy and the EMDR flash technique (Brouwers et al., 2021). The findings add to the growing body of evidence that regulating processes in the phase of consolidation of recently triggered trauma events via visuospatially demanding mental skills might help modify intrusive, unpleasant experiences and reduce their emotionality and other elements of memory (de Jongh et al., 2001).

The differences between EMDR and the EMDR flash technique primarily lie in their methodologies and patient experiences. EMDR involves bilateral stimulation while processing traumatic memories, which can be emotionally intense for clients. In contrast, the flash technique aims to reduce the emotional distress associated with aversive memories by encouraging positive imagery without requiring clients to actively recall the distressing memory, thereby making it potentially less distressing (Brouwers et al., 2021). However, EMDR and the EMDR flash technique share similarities in technical structure and origin and differ in their technical structure and origin. The flash technique is a recent strategy designed to help patients process traumatic memories more rapidly and with less distress. This technique aims to mitigate the emotional impact of a traumatic event by momentarily reliving it while focusing on a positive image or idea. The EMDR flash technique is intended to be less

demanding than regular EMDR, potentially making it more acceptable to some patients (Alting van Geusau et al., 2023). The EMDR flash technique can be utilised during the preparation phase of EMDR to facilitate access to difficult memories in a less distressing manner, thus enhancing the overall therapeutic process (Manfield et al., 2017).

EMDR typically requires several sessions, during which the therapist facilitates the patient's memory processing stages, which can be emotionally intense and may prolong the time required to achieve results. However, the EMDR flash technique typically involves fewer sessions. It aims for faster results by minimising the time spent on upsetting memories, instead focusing on creating a safe mental environment for the patient (Alting van Geusau et al., 2023). Moreover, in EMDR, the client focuses on the upsetting scene, the negative belief, the level of discomfort, and the associated bodily sensations during bilateral stimulation. During the flow, the body's sensations are also processed. After studying the goal moment and reducing discomfort, a body scan is performed. If discomfort persists, only body sensation desensitisation is performed. Unlike EMDR therapy, the flash technique does not include body scanning in the desensitisation, closing, or closing procedures (Wong, 2021).

Purposeful blinking in the flash technique provides a momentary break from a positive engaged focus, allowing the brain to access the painful memory on its own, outside of the patient's consciousness, via the PAG-amygdala-hippocampus connection (Wong, 2021). Therefore, spontaneous blinking, which most people perform several times per minute, may also involve a similar mechanism. The EMDR flash technique adds EMDR to the dual stimulation sets by flashing the eyes without focusing on the specific traumatic experience. The strategy reduces exposure to the stressful event by limiting the association of painful experiences with continuous relaxation imagery (Yaşar et al., 2021).

The EMDR flash technique and EMDR share numerous similarities and differences; however, the flash technique has specific characteristics that make it distinct from EMDR and other therapy methods. Rare aberrations may be regarded as occurring at the beginning of these pronounced features. The EMDR flash technique offers advantages for therapeutic intervention, such as reduced engagement with the

traumatic experience and a more straightforward administration process compared to EMDR. Furthermore, the treatment is easier to administer in groups because it involves only brief interaction with the painful memory and does not require individuals to describe the distressing experience (Yaşar et al., 2021). The flash technique suggests a feasible method by which individuals might access their traumatic distressing memories for a limited period while an active amygdala is regulated by an activated PFC (Wong, 2021). The EMDR flash technique minimises the need to re-examine distressing experiences. It provides only brief exposure to traumatic content, thereby reducing the risk of dissociation and making the procedure more efficient (Yaşar et al., 2021).

Another feature that distinguishes the flash technique from other techniques is its blindness to the therapist. The flash technique offers significant advantages over various trauma intervention methods, as it allows clients to avoid discussing the specifics of their distressing experiences with others, including the therapist, thereby maintaining a "blind to therapist" approach (Brouwers et al., 2021). The EMDR flash technique offers the advantage of requiring a minimal amount of time to work with and complete a memory. On average, five memories can be addressed in each session. The EMDR flash technique is an EMDR method; therefore, it aligns with EMDR theory. The decrease in the vividness of the terrible image, as well as in the level of discomfort, is an indicator of reduced discomfort associated with traumatic memories during EMDR and EMDR flash techniques (Manfield et al., 2017). Brouwers and colleagues (2021) conducted a study to compare the effectiveness of the EMDR flash technique and EMDR in reducing the vividness, discomfort, and emotionality associated with the targeted image in the context of traumatic experiences. They hypothesised that when used as a fast intervention, the flash technique would be more effective than the EMDR treatment in reducing the emotional responses and vividness of an autobiographical traumatic memory. The study involved 60 non-clinical volunteers who could recall a painful autobiographical experience. Emotionality and vividness were assessed before and after the intervention, as well as during a 1-week follow-up. There were no significant differences between the EMDR flash technique and EMDR in terms of emotionality or vividness, declines from pre- to post-treatment, and during follow-up. However, the results indicated that participants had a more

positive response to the flash technique than to EMDR after treatment (Brauwers et al., 2021).

The EMDR flash technique maintains a positive memory state (PEF) in the client and reduces the emotional impression of the traumatic experience. Because the clients remain in a pleasant memory state for an extended period and seem to have short-term exposure to the distressing content, it is evident that the emotional impression of the traumatic experience reduces as the EMDR treatment proceeds (Yaşar et al., 2021).

2.5.6. Complementary and Alternative Approach

Various theories have addressed the nature of fear and anxiety, and aviophobia specifically. The subsequent section provides a brief overview of the principal non-CBT approaches in the literature, including psychoanalytic theory, existential theory, bibliotherapy, and hypnotherapy, along with critiques of each.

According to psychoanalytic theory, the origins of fears, particularly phobias, stem from unconscious conflicts, which are typically linked to Oedipal worries, repressed emotions, and early childhood anxieties. Phobias represent a regression in response to perceived danger, influenced by early events and character development (Ferber, 1959). However, the psychoanalytic theory of phobias has significant theoretical and practical issues. First, its reliance on case studies and subjective judgements lacks scientific rigour (Wolpe & Rachman, 1960). Furthermore, the hypothesis rejects well-established behavioural processes of fear conditioning (Mowrer, 1947). Additionally, it overlooks genetic and neurological evidence (Kendler et al., 1992; LeDoux, 1996). Considering all these assessments, it is evident that modern psychology advocates for empirically supported behavioural, cognitive, and biological explanations (Craske et al., 2017; Öhman, 2008).

Existential psychotherapy is fundamentally based on the idea that avoiding confronting death, freedom, isolation, and meaninglessness is the source of psychological distress (Blount, 1979). This therapeutic approach focuses on human experience rather than merely symptoms, exploring how individuals relate to these existential anxieties and how avoidance or denial can lead to anxiety and fear. It

therefore emphasises the role of personal responsibility and the search for meaning in understanding anxiety and fear, including the fear of flying (Heidenreich et al., 2021). In recent years, the scientific role of existential issues such as the fear of death in mental disorders such as depression and PTSD has begun to be addressed more widely (Iverach et al., 2014). CBT-based techniques, such as VRET, are well-proven and scientifically rigorous (Rothbaum et al., 2000). However, existential psychotherapy is often criticised for several challenges

Another alternative approach, bibliotherapy, is a therapeutic method that utilises written resources, such as books and articles, to help individuals address emotional and psychological issues. As a self-help tool, it enables people to connect with information that resonates with their feelings and experiences (Wootton et al., 2018). The effectiveness of bibliotherapy in alleviating aviophobia is shown by the provision of practical tools and procedures to clients. Aviophobia sufferers may gain confidence and abilities to overcome their phobias using this strategy (Palmer et al., 2000). While bibliotherapy may decrease fear and anxiety, it has several disadvantages, including lower effectiveness than therapist-led therapies, high dropout rates, delayed benefits, reduced motivation, and reliance on one's own drive and literacy (Krijn et al., 2007; Marrs, 1995; Yuan et al., 2018). Bibliotherapy may be helpful with other fears, but there is minimal evidence for aviophobia (Nordin et al., 2010).

Hypnosis is a type of psychotherapy that may help clients modify their ways of thinking, feeling, and acting by placing them in a state of trance where they are more open to ideas. Hypnotherapy successfully alleviates anxiety and depressive symptoms in psychiatric patients when compared to traditional treatment methods (Chiu et al., 2018). The scientific support for hypnotherapy is constrained by its abstract nature, difficulties with training and integration due to vague thinking, resistance to standardisation and manualization, and several methodological shortcomings (Heidenreich et al., 2020). It may target specific symptoms, such as anxiety, stress, or phobias, and is frequently applied in combination with other types of psychotherapy (Olendzki et al., 2020; Wofford et al., 2023). Several case reports and limited research indicate that brief, targeted hypnotherapy may mitigate aviophobia; however, these findings are constrained by low size and rigour (Saadat et al., 2014).

2.5.7. Single-Session Treatments

Single-session treatments are highly effective methods for addressing clients' problems. One-session treatment was found to be more profitable than multi-session CBT for children and adolescents with specific phobias, with lower costs and similar quality-adjusted life years (Wang et al., 2022). Similarly, the Alleviating Specific Phobias Experienced by Children Trial (ASPECT) examined whether single-session treatment is non-inferior to multiple-session CBT in treating specific phobias in children and adolescents (Wright et al., 2022). One-session treatment showed comparable clinical effectiveness with slightly lower costs and similar quality-adjusted life years, supporting its use as a viable and efficient alternative (Reeves et al., 2024). Ollendick and Davis (2013) investigated the efficacy of single-session treatment for specific phobias in children and adolescents aged 7 to 17 years. The study indicated that one-session treatment is usually beneficial across several phobia subtypes and demographic groups, with no appreciable variations in outcomes depending on age, gender, or comorbidity, therefore demonstrating its broad applicability in treating young people with specific phobias. A comparison of one session of exposure therapy and five sessions of cognitive therapy for claustrophobia found both to be significantly effective (Öst et al., 2001).

Single-session VRET was also effective in reducing aviophobia (Mühlberger et al., 2001). There are several studies of single-session treatment for aviophobia. For example, one session and five sessions of exposure therapy were compared for aviophobia, and both were efficient (Öst et al., 1997). Moreover, Mühlberger and colleagues (2003) investigated the effectiveness of three different therapy methods for aviophobia: CBT and motion simulation, CBT and VRET and CBT only. It was found that aviophobia decreased with only virtual VRET combination groups even after six months. In addition, Newgent and colleagues (2006) examined that single-session EMDR treatment applied in-flight is effective in the treatment of non-traumatic aviophobia.

The effectiveness of single-session EMDR and the EMDR flash technique has been supported by various studies, demonstrating significant improvements in psychological symptoms associated with anxiety and trauma. For instance, after just a

single EMDR session, people with specific phobias demonstrated markedly diminished fear responses (Faretta & Dal Farra, 2019). Furthermore, after a brief EMDR psychotherapy, patients with a generalised anxiety disorder reported significant improvement in anxiety symptoms (Raboni et al., 2021).

In conclusion, single-session treatments offer a fast and cost-effective solution for phobias, reducing both cost and drop-out rates. This method combines cognitive restructuring, desensitisation, psycho-education and skills training in a single intensive exposure session, providing an efficient treatment. Research shows that single-session therapies can be applied successfully, especially for aviophobia. While studies indicate the successful implementation of single-session therapy, further research is required, particularly for aviophobia.

2.5.8. Online Therapy/Teletherapy

In the digital and innovative age, it is compelling for mental health professionals to adapt to technological developments. When applied correctly, online therapy, also known as teletherapy, is a safe and supportive method for clients to manage stress (Wiederhold, 2018). A meta-analysis of 39 studies demonstrated that internet-based psychotherapeutic interventions, primarily CBT, were efficacious, with greater effect sizes associated with increased therapist contact (Bandelow & Wedekind, 2022). Botha-Ravyse and colleagues (2020) indicated that VRET is effective online; however, caution is essential due to the limited studies in the field. The online compliance level of clients can be measured using online scales before treatment to reduce treatment-related discordance.

Comparing online therapy with face-to-face therapy, in the context of anxiety and depression, remote psychotherapy delivery can be considered a practical alternative to conventional face-to-face psychotherapy. This is particularly significant for individuals who may encounter challenges accessing in-person healthcare due to various barriers (Lancia et al., 2023). Online psychotherapy is more accessible than face-to-face therapy, enabling clients to participate from the comfort of their homes, thereby improving adherence and client satisfaction (Willemsen et al., 2024). It provides clients with an encouraging, safe atmosphere that helps them manage their

stress (Wiederhold, 2018). It offers significant advantages in terms of accessibility, cost, and convenience, making it a viable alternative to face-to-face sessions. Online sessions offer the practical opportunity to reach a wider audience. They also help to overcome limitations associated with in vivo exposure, such as the need for access to a real aeroplane (Campos et al., 2016).

Meta-analyses of the efficacy of online psychotherapy suggest that these treatments may be as successful as one-on-one therapy (Andrews et al., 2010; Andrews et al., 2018). For prevalent mental health issues, including anxiety and depression, Carlbring and colleagues' (2018) thorough meta-analysis revealed that online cognitive behavioural treatments had therapeutic benefits that were on par with those of in-person cognitive behavioural therapy. Similarly, Andrews and colleagues (2010) conducted a comprehensive analysis of RCT studies and found that online interventions for anxiety, depression, and panic disorder produced outcomes comparable to one-on-one therapy. The findings suggest that the effectiveness of therapy is not primarily determined by the mode of delivery (online or one-on-one), provided that essential components, such as the therapeutic relationship and structured protocols, are maintained.

Online Digital Mental Health Interventions (DMHIs) can reduce depression and anxiety symptoms, and they exist as websites, apps, video-based therapy, and online rehabilitation programs (Huang et al., 2024). A study was conducted to examine the intervention outcomes (depression and anxiety symptoms) of a therapist-assisted Online Digital Mental Health intervention at the 24-month follow-up with e-CBT. Following the completion of the 8-week online program, which 380 participants undertook, statistically significant reductions in depression and anxiety symptoms were observed (Pettitt et al., 2024). Similarly, another study indicated that e-CBT is just as successful compared to standard therapy, with substantial reductions in symptoms of anxiety reported after 12 weeks (Chermahini et al., 2024). Furthermore, incorporating app support into online treatment has been associated with greater client engagement and improved outcomes (Willemsen et al., 2024).

Various meta-analyses have shown that online CBT therapy is significantly effective in reducing PTSD symptoms (Lenferink et al., 2020; Lewis et al., 2019). In a group of

snake-phobic patients, the researchers evaluated guided online self-help with single-session exposure therapy—the online treatment comprised of four weekly written sessions given on a website. Following a brief orientation session, the therapist administered a three-hour session. It was indicated that guided online-delivered exposure treatment is a potential treatment option for snake phobia (Andersson et al., 2013)

Furthermore, online CBT or EMDR therapy was applied to 38 patients with acute stress disorder, and it was observed that anxiety symptoms decreased by 30% and depression symptoms by 50% in both therapy methods (Perri et al., 2021). In contrast, the effectiveness of online EMDR therapy was examined as doubtful for PTSD clients (Lenferink et al., 2020). Internet-delivered EMDR (e-EMDR) represents an efficacious and viable online therapeutic modality, with eye-movement facilitation yielding greater reductions in subjective distress (Mischler et al., 2019). e-EMDR therapy reduced symptoms for clients, including those with anxiety disorders, in a way that was both statistically significant and clinically meaningful (McGowan et al., 2021). According to a study, the online EMDR R-TEP treatment can effectively reduce PTSD symptoms in a variety of high-risk populations during the COVID-19 pandemic. Results showed that online EMDR has the potential to be a practical and successful trauma intervention, especially when in-person therapy is not an option (Yurtsever et al., 2022).

A considerable amount of research has shown that online psychotherapy is effective for treating anxiety and depression. Recent scientific research confirms the effectiveness of online psychotherapy techniques such as iCBT, e-EMDR, telemedicine, and online VR-based therapies in treating anxiety disorders and phobias (Andrews et al., 2010; Botha-Ravyse et al., 2020; Lenferink et al, 2020). These interventions yield equivalent results to traditional one-on-one therapies, with the added benefits of accessibility, flexibility, and cost-effectiveness (Andrews et al., 2018; Carlbring et al., 2018). (Botha-Ravyse et al., Lenferink et al., Levy et al., 2016).

2.6. The Research Design/Strategies That Were Used in Previous Studies

Research on aviophobia predominantly uses experimental, quasi-experimental, and correlational designs (Campos et al., 2019; Fehribach et al., 2021; Tortella-Feliu et al., 2014). While experimental studies evaluate the effectiveness of interventions such as computer-assisted exposure therapy (Tortella-Feliu et al., 2014), retrospective quasi-experimental research design (Gottlieb et al., 2021), and randomised controlled trial (RCT) research designs (Campos et al., 2019; Fehribach et al., 2021), quasi-experimental studies examine treatments in natural settings without random assignment (Lapsekili & Yelboga, 2014). In addition, correlational designs investigate the relationships between variables such as anxiety sensitivity in aviophobia (Bogaerde & De Raedt, 2011), while qualitative studies or reviews provide in-depth insight into individuals' experiences of it (Clark & Rock, 2016; Özant & Kelleci, 2021). Multiple studies have employed RCTs to evaluate VRET against standard exposure therapy and a wait-list control group. For example, in an RCT, participants were randomly assigned to intervention groups, and outcomes were assessed via post-treatment and follow-up assessments (Rothbaum et al., 2000, 2002, 2006). Similarly, another RCT design demonstrates the efficacy of the online treatment NO-FEAR Airlines program for symptoms related to flying anxiety. Several case studies demonstrated the effectiveness of VRET for anxiety and fear associated with flying (Rothbaum et al., 1996). In conclusion, experimental designs remain the most common because they can establish causal relationships.

The body of research on the treatment of specific phobias, such as aviophobia, primarily focuses on multi-session CBT and VRET conducted in face-to-face settings (Baños et al., 2002; Botella et al., 2004; Rothbaum et al., 2002). Limited evidence exists on the efficacy of single-session therapy regimens, especially those administered online (Mühlberger et al., 2003; Mühlberger et al., 2006; Öst, 1989). Existing research supports the efficacy of online multi-session CBT and EMDR flash procedures (Carlbring et al., 2018). However, there is a lack of systematic evaluation on the viability and efficacy of a single-session, intense, self-directed online intervention. In this context, the objective of the current study is to address a critical gap in the literature by examining the efficacy of single-session online VRET and flash

techniques. This will serve as a practical demonstration of the validity of a more accessible, cost-effective, and rapid treatment option.

2.7. The Research Questions and Hypotheses

Aviophobia is a prevalent specific phobia that causes clinically severe anxiety and functional impairment (American Psychiatric Association, 2013). Cognitive-behavioural therapies based on exposure principles are regarded as the most efficacious treatments for this disease, supported by empirical evidence (Wiederhold et al., 2002). Nevertheless, traditional in vivo exposure techniques exhibit several limitations, including elevated costs, time requirements, accessibility issues, and challenges in implementation due to fear of flying (Mühlberger et al., 2001, 2003). To address these challenges, innovative digital intervention modalities, such as VRET, have been developed and gained prevalence in recent years, facilitated by technical advancements (Ribe-Vines et al., 2023). Recent research indicates that VRET yields reductions in avophobia symptoms equivalent to those achieved with conventional CBT (Emmelkamp & Meyerbröker, 2021).

In addition, research has indicated that EMDR therapy is efficient in treating anxiety disorders. Among the protocols developed by Manfield and colleagues, the EMDR flash technique stands out as easier for clients and has the potential to quickly reduce the intensity of traumatic memories (Manfield et al., 2017, 2021). Pioneering research has demonstrated that the EMDR flash technique yields rapid results, particularly in the treatment of trauma and phobias (Manfield et al., 2021). This research intends to fill a significant gap in the literature by comparing the efficacy of a culturally customised VRET protocol with the EMDR flash technique for the treatment of aviophobia. Therefore, the objective of this research was to develop protocols for single-session online VRET and the EMDR flash technique, and to assess their efficacy in alleviating aviophobia.

This study examined a significant gap in the literature regarding single-session, online interventions for specific phobias. It contributes by pioneering and empirically validating a treatment model that is both accessible and resource-efficient, thereby enhancing the reach and scalability of evidence-based psychological interventions.

Prior research has shown the partial efficacy of VRET, EMDR, and flash techniques in addressing anxiety disorders, including aviophobia. This research sought to evaluate the efficacy of a single session of online virtual reality therapy (OVRET) and the online EMDR flash technique on aviophobia, excluding relaxing or breathing methods. Hence, this research aimed to investigate the efficacy of exposure and flash techniques alone in a single session. The following hypotheses were formed within the scope of the study in line with this general objective:

- **Hypothesis 1**

Research Question 1: Does a single session of OVRET significantly decrease fear, anxiety levels and avoidance behaviours in individuals who are afraid of flying when compared to the only psycho-education group?

H1. Single-session OVRET intervention decreases fear, anxiety levels and avoidance behaviours for fear of flying compared to the psycho-education only group at posttreatment.

a. The participants of the OVRET group have lower scores of the FAS test compared to the psycho-education only group at post-treatment, compared to the pretest to post-test.
b. The participants of the OVRET group have lower scores of the FAM test compared to the psycho-education only group at post-treatment, compared to the pretest to post-tests.
c. The participants of the OVRET group have lower scores of VAFAS compared to the psycho-education only group at post-treatment, compared to the pretest to post-tests.
d. Compared to the psycho-education group, more participants from the OVRET group fly after the intervention.

- **Hypothesis 2**

Research Question 2: Does a single session of EMDR flash technique intervention significantly decrease fear, anxiety levels and avoidance behaviours in individuals who are afraid of flying compared to the psycho-education group, compared to the pretest to post-test?

H2. Single-session online EMDR flash technique intervention will decrease fear, anxiety levels and avoidance behaviours for fear of flying compared to the psycho-education only group at posttreatment compared to the pretest to post-test.

a. The participants of the EMDR flash technique group have lower scores of the FAS compared to the psycho-education only group at post-treatment, compared to the pretest to post-tests.
b. The participants of the EMDR flash technique group have lower scores of the FAM test compared to the psycho-education only group at post-treatment, compared to the pretest to post-tests.
c. The participants of the EMDR flash technique group have lower scores of VAFAS compared to the psycho-education only group at post-treatment, compared to the pretest to post-tests.
d. Compared to the psycho-education group, more participants from the EMDR flash technique group fly after the intervention.

- **Hypothesis 3**

Research Question 3: Is a single session of OVRET and EMDR Flash interventions equally efficacious in reducing fear, anxiety, and avoidance behaviours in individuals with a fear of flying from pretest to post-tests?

H3. The single-session OVRET and the online EMDR Flash interventions are equally effective in reducing participants' fear, anxiety levels and avoidance behaviours for fear of flying from pretest to post-tests.

a. The single-session OVRET and the online EMDR Flash interventions are equally effective in reducing participants' FAS test scores from pretest to post-test.
b. The single-session OVRET and the online EMDR Flash interventions are equally effective in reducing participants' FAM test scores from pretest to post-tests.
c. The single-session OVRET and the online EMDR Flash interventions are equally effective in reducing participants' VAFAS test scores from pretest to post-tests.
d. A similar number of participants from the OVRET and EMDR flash technique groups fly after the intervention.

CHAPTER III

METHOD

The method section begins by outlining the research design, followed by details on the participants and the measurement instruments. The method section outlines the research methodology and provides a detailed description of the intervention procedure. Next, the data analysis process was described.

3.1. Participants

Participants were allocated using convenience sampling. First, Ibn Haldun University Psychotherapy Clinical Centre (IPAM) announced the research on social media, and those interested in applying completed the forms via the Google Forms link. Researchers contacted those who applied for the study by telephone and conducted a preliminary interview. Those who met the inclusion criteria were accepted into the project. In the current study design, three groups of intervention techniques were included for comparison purposes: OVRET, the flash technique, and psychoeducation.

The sample of this study consists of adults with aviophobia. The study included 62 participants who completed the scales via a link provided in a social media announcement. The inclusion criteria for the participants were as follows: they were between 18 and 65 years old, had at least a high school education, were native Turkish speakers, and had a fear of obtaining a flying score of more than 4 on the Clinical Global Impressions Scale (CGI) (Guy, 1997). Participants who were currently receiving therapy for aviophobia, who were at risk of harming themselves or others, who had major depressive disorder, psychosis, or alcohol dependence, who were flight crew members, and who were pregnant were excluded from the study. The study included two individuals with heart disease, with permission from their doctors.

The study invited participants aged 18–65. The sample consisted of individuals aged 21 to 65 years, with a mean age of 37 and a standard deviation of 10.2. Females comprised 74.4% of the participants (n = 48), while males accounted for 25.6% (n = 14). Regarding education, 11.3% of participants were high school graduates (n = 7), 37.1% were university graduates (n = 23), and 51.6% were postgraduates (n = 32). 27.4% of participants were married (n = 48), 71% were single (n = 44), and 1.6% were cohabiting (n = 1). Additionally, 59.7% of the participants were from Istanbul (n = 27), while 40.3% were from outside Istanbul. In terms of flying experience, four participants had no prior flying experience, while 58 participants had some flying experience. In terms of methods of coping with their aviophobia, 32 participants (61.3%) tried to manage their fear by sleeping, watching screens, reading, chatting, or playing games; 22 participants (35.5%) managed their fear by avoidance, and two participants (3.2%) took medication to manage their fear.

3.2. Measurements

The pretest included informed consent, sociodemographic forms and questions about flight history, the Clinical Global Impressions Scale (CGI) (Guy, 1976) to observe symptom severity by clinicians, the Flight Anxiety Situations Questionnaire (FAS) (van Gerwen et al., 1999) to measure anxiety at different stages of the flight, the Flight Anxiety Modality Questionnaire (FAM) (van Gerwen et al., 1999) to measure cognitive and somatic anxiety associated with flight, and the Visual Analogue Flight Anxiety Scale (VAFAS) (Freyd, 1923) for the subjective identification of the general level of aviophobia. The aim was to observe changes in participants' subjective fear of flying using the VAFAS test, in their fear of flying using the FAS test, and in cognitive and somatic anxiety levels using the FAM test before and after the treatment. Changes in avoidance behaviour were observed via actual flight, taken after the treatment.

To maintain validity and reliability, the researcher exclusively used standardised scales. Scales previously used to treat aviophobia were preferred, in accordance with the literature (Van Gerwen & Wolfger, 2004). Several methods were used to standardise protocols and minimise extraneous variables, including pre-recorded standard psycho-education videos, written protocols, and standard verbal instructions for therapists.

3.2.1. The Sociodemographic Form

The participants who wanted to participate in the study were first presented with the sociodemographic information form prepared by the researcher. This form consisted of 20 questions, including age, gender, nationality, marital status, place of residence, educational status, information about chronic diseases, regular drug use, and flight history. The form is presented in Appendix 1.

The purpose of the form was to evaluate the participants' demographic characteristics, health status, and flight history. Participants were asked to provide information about their flight history, including the number of one-way flights they had taken throughout their lives, the last time they flew, and whether they had previously received treatment for aviophobia (Van Gerwen et al., 1997). Educational status is classified as an ordinal scale, whereas the others are categorised as nominal scale questions. Conversely, the age variable is a quantitative measurement on the ratio scale. This form aids in understanding the respondents' backgrounds and analysing the study's results.

In parallel with previous studies, four self-report items were included in the flight history section to assess flight experience, duration of fear, coping methods, and history of treatment for aviophobia (van Gerwen et al., 1997). This ordinal scale aimed to investigate the client’s flight history comprehensively, identify the subjects and duration of difficulties associated with aviophobia, explore coping methods, and gather information on previous treatment-seeking behaviour.

In the study, participants were asked about their flight experience, reasons for not having flight experience, first year of flight, last year of flight, duration of aviophobia, number of flights before the onset of fear of flying, and number of flights after the onset of fear of flying in an open-ended manner. Additionally, four multiple-choice options were presented to indicate the average frequency of flights, ranging from "never" to "several times a year." In the question of how you cope with aviophobia, the following options were given: avoiding flying, praying during the flight process, using relaxing medication, sleeping on the flight, being busy with a screen, a game, a book, or a chat, using alcohol, and others.

3.2.2. Flight Anxiety Situations Questionnaire (FAS)

The Flight Anxiety Situations Questionnaire was developed by van Gerwen and his colleagues in 1999 to evaluate anxiety associated with flight in various circumstances. The FAS is an inventory that includes 32 self-reported items, using a five-point Likert-style response format and answers ranging from 1 “no anxiety" to 5 "overwhelming anxiety”. The questionnaire assesses anxiety about flying across various flights (Nousi et al., 2008). The FAS test score range is between 30 and 150, with higher scores indicating intense flight-related anxiety. Van Gerwen and colleagues (1999) suggested cut-off points of around 56 for the FAS total score in clinical diagnosis and 70 points for optimal diagnostic sensitivity.

The FAS scale has three main components: generalised anxiety about flying (14 items), anticipatory anxiety about flying (11 items), and in-flight anxiety (7 items) (Van Gerwen et al., 1999). The reliability and internal consistency of all scales range from .90 to .92 on the test-retest scale and from .88 to .97 on the Cronbach's alpha scale. The FAS test was adapted into Turkish by Yılmaz Halıcı et al. in 2024, and the Cronbach's alpha value was .98.

3.2.3. Flight Anxiety Modality Questionnaire (FAM)

Van Gerwen and others designed the 18-item Flight Anxiety Modality Questionnaire (the FAM Test) in 1999. The FAM test is a self-report measure designed to assess various symptoms of anxiety or anticipation anxiety that occur in flying situations, which are perceived as anxiety related to the flight environment (Van Gerwen et al., 1999). Each condition is assessed on a Likert scale ranging between 1, "not at all," and 5, "very intensely." The FAM assesses the three dimensions of anxiety presented in flight situations: (a) 11 items for psychosomatic form, which is concerned with physiological symptoms, and (b) 7 items for cognitive form, which includes disturbing cognitions (Nousi et al., 2008). While the score range for the cognitive sub-dimension of the scale is between 7 and 35, the possible score range for the physical sub-dimension is between 8 and 40. High scores indicate the presence of intense physical and cognitive symptoms associated with a fear of flying. The Cronbach's alpha

coefficient for the FAM test was reported as .89 (Van Gerwen et al., 1999). A cut-off score of 56 was proposed for the FAM (Van Gerwen et al., 1999).

The FAM scale was adapted into Turkish by Yılmaz Halıcı et al. in 2024, and the Cronbach's alpha was 0.89. The Cronbach's alpha values were 0.92 for the cognitive dimension and 0.91 for the physical dimension.

3.2.4. A Visual Analogue Flight Anxiety Scale (VAFAS)

Freyd designed the first Visual Analogue Scale in 1923 (Freyd, 1923). Hornblow and Kidson developed a Visual Analogue Flight Anxiety Scale (VAFAS) in 1976 to assess the Visual Analogue Flight Anxiety Scale (VAFAS); respondents were asked to respond to the following one-tailed question using each VAFAS scale that ranged between 0 (no anxiety) and 10 (terrified). The VAFAS asks individuals to rate their fear of flying on a one-tailed scale (Hornblow & Kidson, 1976). A value of 0 indicates the absence of fear, whereas high scores indicate the intensity of fear of flying. Their study confirms the criterion validity of VAFAS and suggests its potential as an anxiety measure. No specific training was provided for using the scales for subjects, and only instructions were printed on the test forms. The VAFAS test, a visual test consisting of a single question in Turkish, has not undergone any reliability or validity studies.

3.2.5. Subjective Units of Distress Scale (SUDS)

Joseph Wolpe developed the Subjective Units of Distress Scale in 1969 to evaluate the subjective anxiety level of clients in behavioural therapies (Wolpe, 1969). Participants were asked to rate their discomfort on a scale of 0 to 10. A score of 0 indicates no discomfort; higher scores indicate increasing levels of discomfort. The SUD value was used during the OVRET exposure. The clients' discomfort levels were monitored during exposure by asking them to report their SUD value every 3 minutes. Although it is not a direct adaptation of the term 'suds' into Turkish, it is frequently used in many studies (Kavakçı et al., 2010; Kaya & Karaaziz, 2023).

3.2.6. The Clinical Global Impressions Scale (CGI)

Guy first developed the CGI in 1976. It is designed to be used with a general scoring and has three global items (Guy, 1976). The level of severity of illness and overall improvement are two of the elements that can be assessed on a 7-point scale. The third item, the efficacy index, demands an evaluation of the relationship between treatment efficacy and adverse responses (Guy, 1976). The present study employed the CGI to assess participants' levels of psychopathology related to their fear of flying. The CGI can be a helpful and simple tool for practising psychiatrists or clinicians. It is a simple and quickly comprehensible quantitative approach that can support the intervention over time (Busner & Targum, 2007). According to Busner and Targum (2007), the CGI scale, as applied by the clinician, measures the level of psychopathology using a 7-point assessment that considers both symptom severity and functionality. '1' indicates a normal level, that is, the symptoms related to the disorder are not present; "4" indicates a moderately ill level, that is, the symptoms are noticeable and begin to affect the level of functioning; and "7" indicates an intense level of psychopathology in the specified area and indicates that the disorder interferes with the person's life in many areas.

There is no widely accepted cut-off score for defining psychopathology for CGI; nevertheless, a score of 4 (moderately ill) is frequently regarded as an indication of a significant clinical issue (Busner & Targum, 2007). The purpose of using the CGI scale in the study was to identify individuals with a fear of flying, as perceived by clinicians, and to determine the level of fear of flying. Therefore, the study included clients with a CGI value of 4 and above. The standardisation of global illness severity assessment documentation through the CGI has demonstrated high inter-rater reliability ($r = 0.768$) and validity. CGI assessors typically conducted interviews within a duration of 10 minutes. The SIGGI has the potential to enhance global rating documentation and accuracy in clinical studies (Targum et al., 2013). However, there is no direct adaptation for the CGI.

3.2.7. Test Flights

To observe flight-related avoidance behaviours, the present study asked participants to fly within a month after treatment. Participants were informed before the study began that they would have to fly afterwards, and those with special conditions were excluded. No route, flight time, or airline company restrictions applied to the participants. The participants were asked to provide their individual flight tickets.

3.3. Apparatus

OVRET was conducted using the XR Health Virtual Reality Platform, which required a laptop and an internet connection. Both therapists and participants downloaded the XR Health mobile or tablet application. The application was connected to the Pious—Pro platform with a single click initiated by the therapist during a phone or video call. By using the platform, participants received teletherapy services via a smartphone and a virtual reality headset. The XR Health platform was synced with the virtual reality headset, which included a head-mounted display system and earphones. The therapist shared a special code with the participant, and work on the platform began after it was entered.

Declaring generative AI and AI-assisted technologies in the writing process. We declared that we employed artificial intelligence technology in anticipation of the research. We conducted our research using Co-Pilot, SciSpace, and scite.ai. Additionally, we utilised ChatGPT to organise and condense our prepared content. We also utilised deepl.com, Quilbot, ChatGPT, and DeepSeek to complete the English adaptation and revision of the content.

3.4. The Team of Psychotherapists

A team of psychotherapists, including seven therapists with graduate-level degrees certified in CBT and EMDR, applied the treatment protocols. All therapists hold CBT and/or EMDR certification and have been trained in the research-based protocols and Virtual Reality Therapy. Furthermore, the researcher supervised all therapists during the experimental process, under the guidance of thesis supervisors Assoc. Prof. Burcu

Uysal and Dr Taha Burak Toprak are accredited psychotherapists in EMDR and CBT. Moreover, Prof. Dr Hakan Türkçapar, an Academy of Cognitive Therapy (ACT)-accredited instructor and supervisor, and Clinical Psychologist Emre Konuk, an EMDR Europe and EMDR Institute-accredited instructor and supervisor, provided supervision throughout the development and practical application of the OVRET and flash technique protocols, respectively.

Different psychologists administered the treatments to ensure that the protocol's effectiveness was independent of the therapist's influence. Seven psychologists, including one supervisor, conducted the investigation. When several psychotherapists implement the fear of flying protocol, a potential risk of discrepancies in evaluation subjectivity and adherence to the protocol exists. Therefore, to reduce subjectivity in assessing a psychotherapy team, all team members were trained and supervised for 3 months per protocol. Each therapist held a bachelor's degree in psychology and had certifications in cognitive-behavioural therapy (CBT) and/or eye movement desensitisation and reprocessing (EMDR). Research fidelity evaluation was made through supervision and observation. Throughout the observation, each therapist implemented the protocol independently, while the supervisor provided individualised feedback to each therapist. The researcher is a doctoral candidate in clinical psychology with 10 years of experience in maintaining the treatment. The researcher holds two levels of EMDR certification, including Memory Reconsolidation and the Flash Technique, as well as EMDR certification. The researcher holds certifications in Cognitive Behavioural Therapy from Prof. Dr Hakan Türkçapar and in the Beck-Oriented Cognitive Therapy Programme from Dr Emel Stroop. The supervisor completed training in Virtual Reality Therapy for Anxiety Disorders conducted by Dr Elizabeth McMahon.

3.5. Ethical Statement

The current study obtained ethical approval from the Ibn Haldun University Social and Human Sciences Scientific Research and Publication Ethics Committee, designated as E-71395021-020-11584 and Decision 2022/02-3. This research was funded by the Ibn Haldun University Research Fund (Project Name: Online Single-session Virtual Reality Therapy Program for Fear of Flying, Project Number: 2238).

ClinicalTrials.gov has registered the study with the registration number NCT06758635.

3.6. Procedure

Table 1 illustrates the application of a randomised controlled trial (RCT) and an experimental pretest-posttest group design.

Group A included the experimental group, to which the EMDR flash technique protocol was applied.

Group B: It is the second experimental group to which OVRET was conducted.

Group C: This group was assigned as the waitlist control group, and they received psycho-education only until the treatment of groups A and B was terminated. EMDR flash technique or OVRET protocols were administered in accordance with ethical conditions after the treatment of the experimental groups.

Table 3.1. Group Intervention Duration Pre-Test to Post-Test Duration

OVRET	90 minutes	4 weeks
Flash technique	90 minutes	4 weeks
Psycho-education	60 minutes	4 weeks

Note: OVRET (Online Virtual Reality Exposure Therapy) experiment group; Flash: Online Flash Technique experiment group; PSYCHOEDU: Online Psycho-education control group.

Ibn Haldun University Psychotherapy Application and Research Centre announced the study. (IPAM) And the researcher, through social media organisations such as Instagram, WhatsApp, and LinkedIn and the application was open for 15 days. In the announcement, it was stated that the study was carried out within the scope of the doctoral project; a single 3-hour online session would be held; it was open to people over the age of 18; a symbolic fee would be charged; and they had to make a real flight within 4 weeks. Participants who wished to participate in the study were asked to complete the consent form and the specified scales via the Google link provided in the announcement. Participants received several assessments prior to the treatments, including the Sociodemographic Form, the Flight Anxiety Modality Questionnaire (FAM), the Flight Anxiety Situations Questionnaire (FAS), and the Visual Analogue

Flight Anxiety Scale (VAFAS). The confidentiality of all collected data was ensured. At the end of the duration, applications received by email were compiled into a single pool. Table 1 presents the procedure.

All participants who applied via the Google Link were numbered in order of application and divided into groups of three according to this order. Each participant in the small group was randomly assigned to one of the three groups: OVRET, flash technique, or psychoeducation. The computer performed the random selection process using a 1:1:1 ratio, as specified on the https://www.randomizer.org/ address, in a manner that kept both the client and the researcher blinded. The process persisted until participants were assigned to their respective groups. When enough participants could not be reached for the study, an additional 15 days were announced, and the random selection process was resumed in the same order.

Clinicians questioned candidates over the phone using the Clinical Global Impressions Scale for prospective exclusion criteria and flight history. Exclusion criteria were risk of suicide or self-harm, psychosis, PTSD, recent changes in psychotropic medicine use, and current receipt of therapy for flying phobia. After the initial phone call, participants with a Clinical Global Impression Scale Score of 4 or higher were included in the study. The university clinic required a symbolic fee of 45 Turkish Lira (approximately 2€) from all clients to ensure the Ethical provision of therapy in a professional way. This approach underscores the importance of therapy, aiming to enhance participant commitment and promote client responsibility and openness in the therapeutic process. The purpose of the session was explained over the phone call.

If participants were eligible, a phone call session was scheduled for them. Following the telephone interview, the 'Beginner's Handbook for Clients' to the intervention groups was e-mailed, OVRET, and Flash groups, as detailed in Appendix X. The handbooks provide comprehensive details about the applied methods, the research process, and the principles of psychotherapy. The OVRET group consisted of 19 participants, while the EMDR flash technique group had 22 participants, and the psycho-education group included 21 participants.

IPAM sent a reminder message to the participants one day before the experiment date. IPAM asked the participants to deposit the session fee into the bank account of Ibn Haldun University during the day. An online meeting invitation was created for the fee-paying participants and sent via WhatsApp and email. For the OVRET group only, address information was received from the participants, and phone-compatible goggles were shipped to their addresses. Following the therapy, clients returned their goggles via shipping service, with the shipment expenses paid for by the researcher. The treatment was carried out on the specified appointment date.

The experimental group participants receive a 180-minute single session of the OVRET program or the EMDR flash technique. All groups received online therapy. The participants were asked to fly within 4 weeks after the treatment. Participants received post-treatment scales via WhatsApp as a Google link four weeks later. Figure 1 illustrates the Procedure Follow-up Diagram. Participants in the psycho-education group received no treatment until the experimental groups completed it. For ethical reasons, the treatment was completed 4 weeks later by applying the Flash protocol only to the group that received psycho-education. At the end of the study, all participants received a ‘Certificate of Participation’ as shown in Appendix L, and all volunteer psychotherapists received a ‘Certificate of Appreciation’ as shown in Appendix M.

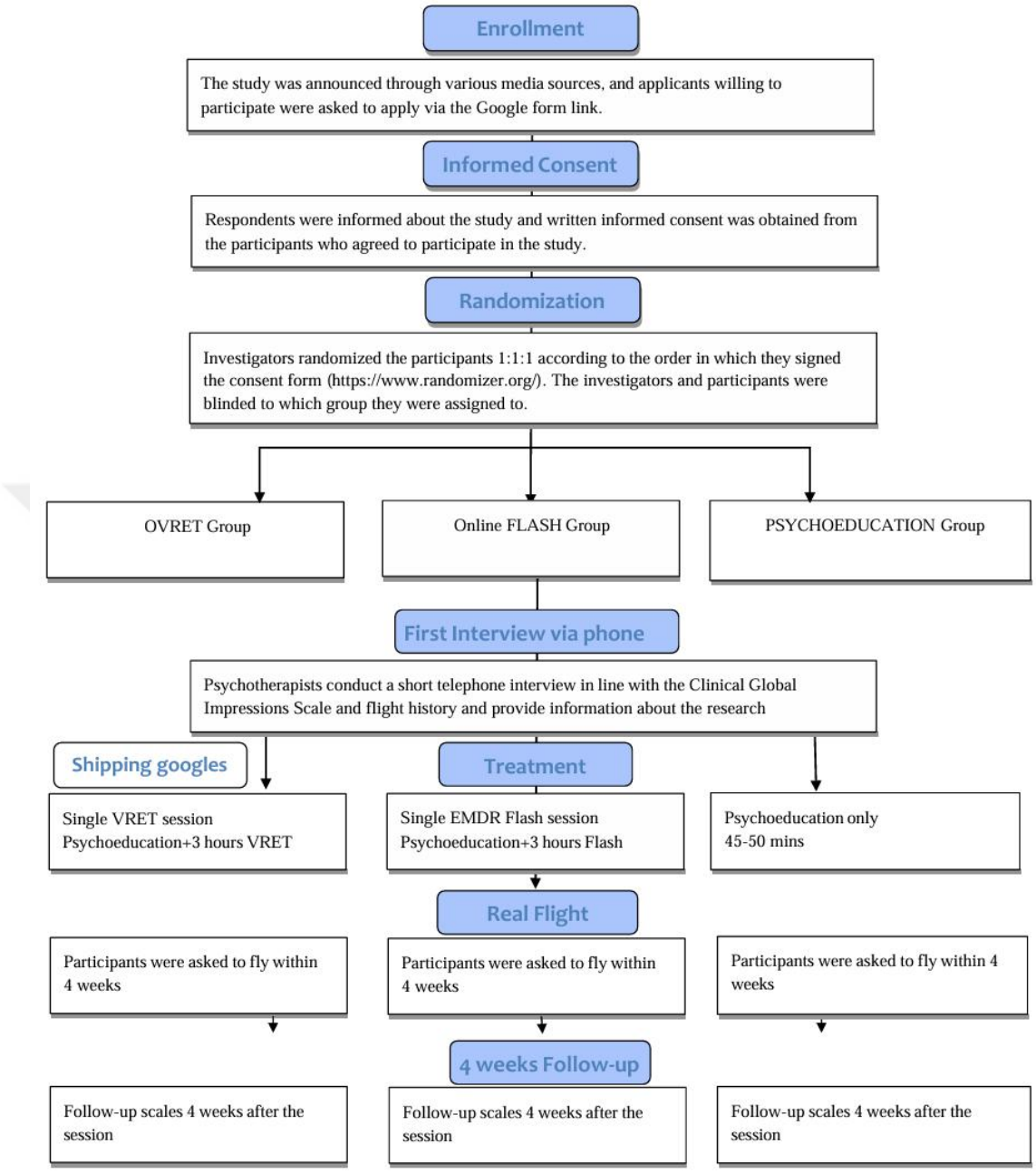


Figure 3.1. The Procedure Follow Diagram

3.7. The Research Protocols

Every group had a protocol handbook that standardised the treatment protocols and therapist instructions. Psychotherapists followed a standard procedure for each participant.

3.7.1. The OVRET Group Protocol

OVRET is utilised in addressing avio-phobia as it enables individuals to confront their fears associated with flying within a secure and regulated setting. This method notably diminishes fear levels and enhances flight activities following treatment (Gottlieb et al., 2021; Price et al., 2021). Therefore, VRET therapy has been integrated into the existing protocol established for addressing aviophobia, consistent with the literature.

OVRET group participants received 180 minutes of single-session OVRET treatment. The psychotherapy session begins with a brief description of the research procedure and intake, which lasts roughly 20 minutes. A 30-minute psycho-educational video follows this. In the third level, psycho-education and VR training last 20 minutes. In the fourth stage, the VR exposure process begins and is completed in three different sessions. The first, second, and third exposures typically last about 30 minutes each. Detailed information about the OVRET protocol is given in Table 2.

Participants were exposed to the steps in order: “clients’ house on a sunny day (the news is on TV), taxi ride on a sunny day (the news is on the radio), boarding gate on a sunny day, flight situation, boarding gate on a rainy day, plane take-off on a rainy day, short turbulence, landing, turbulence appears, flight situation on a rainy day with turbulence, elements of internal sense exposure plus comments, landing on a rainy day with turbulence. The final stage, known as the termination stage, includes review and relapse prevention activities that take around 20 minutes. Participants were asked to schedule flights within 4 weeks following the treatment.

Table 3.2. Stages of OVRET Protocol

	APPROXIMATE DURATION (minutes)
Stage 1: Brief explanation about the research and intake	20
Stage 2: Psycho-education video	30
Stage 3: Psycho-education and VR training	20
Stage 4: Exposure	
First exposure	30
Second exposure	30
Third exposure	30
Stage 5: Termination	
Review, relapse prevention	20

3.7.2. The EMDR Flash Technique Group Protocol

The EMDR flash technique is used to treat aviophobia because it effectively reprocesses traumatic memories and reduces fear reactions. This strategy enables people to reprocess traumatic memories rapidly and successfully (Manfield et al., 2024; Wong, 2021; Yaşar et al., 2022). Therefore, the EMDR flash technique seeks to assist individuals in managing their aviophobia and reducing anxiety during flights by concentrating on positive memories.

EMDR flash group participants received 180 minutes of single-session treatment. The initial phase of the research involves a concise overview of the study and the intake process, which lasts approximately 20 minutes. This is followed by a 30-minute psychoeducation video, similar to those used with other groups. The third stage

involves identifying Positive Engaging Focus (PEF) using a list, which takes approximately 20 minutes to complete. A Positive Engaging Focus (PEF) was identified and tested. The history of traumatic experiences related to flight was assessed, and target memories, beliefs, or feelings were determined.

Psycho-education and planning comprise the fourth step, which lasts for an additional twenty minutes. The fifth stage, which lasts 50 minutes, uses the flash technique to address troubling memories. A target was chosen, and bilateral stimulation (BLS) began. Participants have rapid triple blinking and complete five sets of triple blinking. The therapist requested the participant to control the trauma memory and asked the participant to recognise if any changes occurred. Then, they resumed the five triple-flash cycle until the traumatic memory was no longer effective. The session continued until the target memories were no longer powerful. The sixth stage involves developing a future template and requires a duration of 30 minutes. Relapse prevention and review, which lasts ten minutes, concludes the process. Detailed information about the online EMDR flash technique protocol was given in Table 3.

Table 3.3. Stages of EMDR Flash Technique Protocol

	APPROXIMATE DURATION (minutes)
Stage 1: Brief explanation about the research and intake	20
Stage 2: Psycho-education video	30
Stage 3: Identifying Positive Engaging Focus (PEF) (giving list)	20
Stage 4: Psycho-education and Planning	20
Stage 5: Flash Technique on Disturbant Memories	50

Table 3.3. (cont.)

Stage 6: Future Template	30
Stage 7: Review, relapse prevention	10

3.8. Creation of Psycho-Education Video

Psycho-education videos were prepared to maximise standardisation for different protocols. Initially, the research team prepared the texts for the psycho-education video. The content of the psycho-education video across groups is presented in Table 4. After the video text was prepared, four experts from each occupational group, including psychologists, cabin crew members, aircraft technicians, and pilots, were consulted for expert opinions.

Table 3.4. Content of Psycho-Education Video Across Groups

	OVRET GROUP PSYCHO-EDUCATION CONTENT	EMDR FLASH GROUP PSYCHO-EDUCATION CONTENT
Definition	What is fear? What is aviophobia?	What is fear? What is aviophobia?
Therapeutic approach	What is CBT and Virtual Reality Therapy?	What is EMDR Therapy and flash Technique?
Uncertainties	Aviation uncertainties	Aviation uncertainties
Aerodynamics	How does an aeroplane fly?	How does an aeroplane fly?
Aircraft and Technique	Basic information, air traffic controllers, and the distance between aeroplanes	Basic information, air traffic controllers, and the distance between aeroplanes

Table 3.4. (cont.)

Turbulance	What is turbulence? Is turbulence dangerous?	What is turbulence? Is turbulence dangerous?
Weather conditions	What happens if lightning strikes the aircraft or if the engine malfunctions while in flight?	What happens if lightning strikes the aircraft or if the engine malfunctions while in flight?

The first step in the video preparation phase involved recording short videos of the psycho-education text. The "Davinci Resolve" program then combined and edited the short videos to produce the final version. Two separate psycho-education videos for the OVRET and flash/psycho-education groups were prepared. The sole distinction between the two videos lies in the information they provide about the therapy methods. The OVRET group psycho-education provides information about virtual reality therapy, while the flash group explains EMDR and the flash technique.

3.9. Statistical Analysis

The study investigated the effectiveness of online single-session virtual reality therapy and the EMDR flash technique in reducing aviophobia. A comprehensive statistical analysis was performed to evaluate anxiety levels before and after the intervention between groups. IBM's SPSS 25 software analysed the data collected from the pre- and post-tests. The statistical analysis was carefully selected in this study to align with the research objectives. Firstly, descriptive statistics were used to analyse the demographic characteristics of the participants, including gender, marital status, and educational level. Afterwards, skewness and kurtosis values for continuous data were analysed to assess the validity of the normality assumption. To evaluate the effectiveness of the intervention programmes, the aim is first to compare the pre- and post-intervention scores of the OVRET, EMDR flash, and psychoeducation groups. A 3 (Group: OVRET, EMDR Flash, Psycho-education) × 2 (Time: pre-test, post-test) mixed-design analysis of variance (ANOVA) and Wilks's lambda (Λ) was used to assess the impact of intervention type and time on Flight Anxiety Scale (FAS), the Flight Anxiety Modality (FAM), the Analogue Flight Anxiety Scale (VAFAS) and

flight experience scores. This technique was used to assess between-group variations among intervention modalities, within-group changes over time, and, most importantly, whether the patterns of change over group and time varied across intervention groups (i.e., time × group interaction). Post-hoc pairwise comparisons were performed using the Least Significant Difference (LSD) test to analyse the statistical differences in anxiety, fear, and avoidance behaviours across pairs of groups. The results section of the dissertation presents a comprehensive analysis of statistical findings.

3.10. Data Analysis Preparation

The present dissertation study contained only the data from participants who completed both the pre-test and post-test across all three groups. The data from individuals who completed the post-test assessments were excluded from the research. Therefore, the data of 30 participants who failed to complete the post-test assessments were removed from this study. Prior to data analysis, the dataset was evaluated and structured, and data cleaning was conducted as necessary. The skewness and kurtosis values were examined in order to test the normality assumption in the analysis. Researchers have suggested that a normality value of ±2 to ±7 for skewness and kurtosis is adequate (Hair et al., 2013). Also, a range of strategies can be employed to manage outliers, such as deleting the data and applying transformations (Tabachnick & Fidell, 2013). In accordance with this conclusion, the present research was accepted as having a normal distribution, and four outliers' data were identified that could potentially bias the normal distribution. After data cleaning, skewness and kurtosis values were found to be within acceptable limits, indicating that the normality assumption was met for all variables. Subsequently, the analyses were conducted with 18 participants in the OVRET group, 20 participants in the EMDR flash technique group, and 20 participants in the psycho-education group.

CHAPTER IV

RESULTS

This chapter provides a thorough summary of the study's findings. First, detailed information about the participants' demographics, including their age, gender, and other relevant details, is provided for both the intervention and control groups. In this study, the assumption of normality was evaluated to analyse the distribution characteristics of the Flight Anxiety Situations Questionnaire (FAS), the Flight Anxiety Modality Test (FAM), the Visual Analogue Flight Anxiety Scale (VAFAS) and flight experience. Descriptive statistics and assumption check for the FAS test, the FAM test, the VAFAS test and flight experience were examined. Moreover, the analysis utilised a series of mixed-design Analyses of Variance (ANOVA) to investigate the interaction between the within-subjects factor of time (pre-test, post-test) and the between-subjects factor of group (OVRET, EMDR flash technique, psycho-education) for each measure, with detailed results for assumption checks, main effects, interaction effects, and post-hoc comparisons provided in the subsequent sections.

4.1. Demographic Characteristics of Participants

Table 4.1 provides a comprehensive overview of the descriptive statistics, frequency distributions, and percentages associated with the participants who engaged in the program to address their fear of flying. It includes detailed information on participants' gender, city, marital status, flight status, and frequency of flights between the intervention and control groups. This data is crucial for understanding the demographic characteristics and baseline measures of the sample population.

The study included a total of 62 participants, comprising 48 females (77.4%) and 14 males (22.6%). Most participants were married (71%, n = 44). The majority held a

graduate degree (46.8%, *n* = 29), a bachelor's degree (37.1%, *n* = 23), or had completed high school (8.1%, *n* = 5).

The demographic characteristics of the OVRET group highlight the diversity in terms of gender, education, marital status, and flight experience. The OVRET group consisted of 19 participants, with a gender distribution of 13 women (68.4%) and six men (31.6%), as shown in Table 6. The group's educational background comprises 2 participants (3.2%) with a high school education, 6 participants (9.7%) with a university degree, and 11 participants (17.7%) with a graduate degree. Regarding marital status, 5 participants (8.1%) were single, while 14 participants (22.6%) were married. Most participants (15 participants, 24.2%) were from Istanbul, with the remaining 4 participants (6.5%) from outside Istanbul. Regarding flight status, 18 participants (29%) had flown before, and only 1 participant (1.6%) had never flown.

The EMDR flash group consisted of 22 participants, including 19 women (86.4%) and three males (13.6%). One person held a high school education (1.6%), 11 had a university degree (17.7%), and 10 held a graduate degree (16.1%). Of the participants, five (8.1%) were single, while 17 (27.4%) were married. Most participants (17.7%) were from Istanbul, with 11 (17.7%) from outside Istanbul. Out of the participants, 20 (32.3%) had flown previously, while 2 (3.2%) had never flown. These demographic statistics illustrate the diversity of the flash technique group in terms of gender, education, marital status, and aviation experience.

Table 4.1. Descriptive Statistics for Participant Demographics for the OVRET, Flash, and Psycho-Education Groups

		TOTAL f	% of total	OVRET f	% of total	FLASH f	% of total	Psychoedu	Total
Gender	Female	48	77,4	13	21	19	30,6	16	25,8
	Male	14	22,6	6	9,7	3	4,8	5	8,1
Education	High school	7	11,3	2	3,2	1	1,6	2	3,2
	University	23	37,1	6	9,7	11	11,7	8	12,9
	Graduate	32	51,6	11	17,7	10	16,1	11	17,7
Marital Status	Single	18	29	5	8,1	5	8,1	8	12,9
	Married	44	71	14	22,6	17	27,4	13	21
City	Istanbul	37	59,7	15	24,2	11	17,7	11	17,7
	Out of Istanbul	25	40,3	4	6,5	11	17,7	10	16,1
Flight Status	Flew before	58	93,5	18	29	20	32,3	20	32,3
	Never Flew	4	6,5	1	1,6	2	3,2	1	1,6
Coping Style	Medication	2	3,2	1	1,6	0	0	1	1,6
	Avoidance	22	35,5	6	9,7	7	11,3	9	14,5
	Distraction	28	61,3	12	19,4	15	24,2	11	17,7

The psycho-education group consisted of 21 participants, comprising 16 women (76.2%) and five men (23.8%). Two participants (9.5%) held a high school degree, 8 (38.1%) had a university degree, and 11 (52.4%) had a graduate degree. Eight respondents (12.9%) were single, while 13 (21%) were married. Most participants (17.7%) were from Istanbul, with 10 (16.1%) from outside the city. Twenty participants (32.3%) had flown before, while one (1.6%) had never flown. Psycho-education group is demographically diverse, as seen by these statistics.

Figure 4.1 displays the descriptive data for the participants' age distribution. The participants' ages varied from 20 to 65, with a mean age of 36.6 years (*SD* = 10.1). This indicates a young sample with moderate age variability.

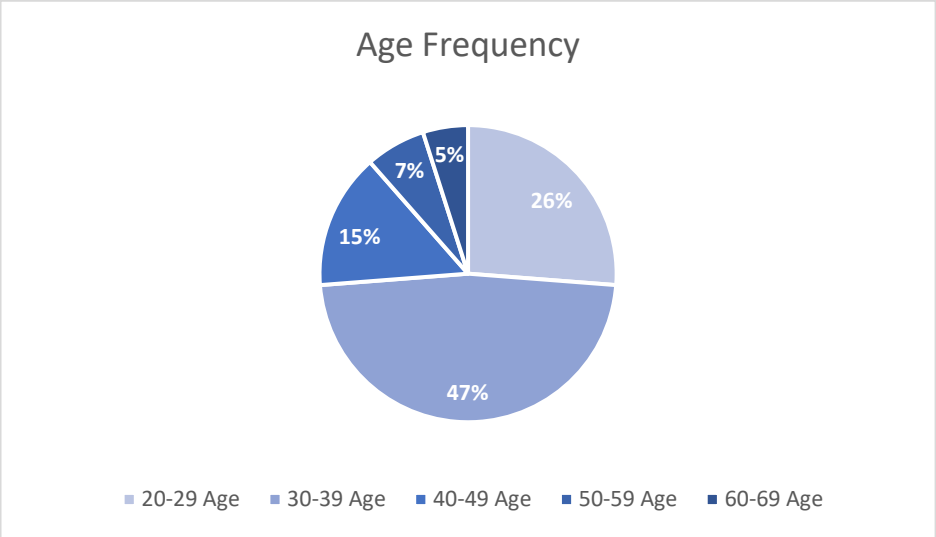


Figure 4.1. Descriptive Statistics Age Frequency

Table 4.2 presents statistics highlighting the variability in participants' flight experiences prior to the onset of fear. The data reveal that 47.5% of participants had never flown before the onset of fear, while 26.2% had flown more than thirty times. Additionally, 14.8% of participants had flown between 11 and 20 times, 8.2% had flown between 1 and 10 times, and 3.3% had flown between 21 and 30 times.

Table 4.2. Flight Frequencies Before the Onset of Fear

Number of Flights	Counts	% of Total
0	29	47.5 %
1-10	5	8.2 %
11-20	9	14.8 %
21-30	2	3.3 %
30+	16	26.2 %

Table 4.3 details flight frequencies after fear begins. The results show that 21.0% of the individuals had not travelled since the phobia began, and 12.9% had flown 11–20 times. Furthermore, 9.7% of participants reported flying between 21 and 30 times, while 8.1% indicated they had flown more than 30 times. The statistics illustrate the variability in participants' flight experiences following the onset of fear.

Table 4.3. Flight Frequencies Following the Onset of Fear

Before Fear	Number of Participants
0 Times	16
0-10	10
11-20	4
31-40	1
91-100	1
1 Times	14
0-10	9
11-20	2
21-30	1
31-40	1
41-50	1
2 Times	5
0-10	5
3 Times	9
0-10	7
11-20	1
21-30	1
4 Times	2
11-20	2
5 Times	16
0-10	12
11-20	2

Table 4.3. (cont.)

21-30	1
41-50	1
Total	62

4.2. Assessment of Normality Assumption: Descriptive Statistics (Skewness and Kurtosis) for Pre and Post-Intervention Scores

The assumption of normality was evaluated to analyse the distribution characteristics of the Flight Anxiety Scale (FAS), the Flight Anxiety Modality Test (FAM), and the Visual Analogue Flight Anxiety Scale (VAFAS). Skewness and kurtosis values were calculated for all metrics during pre-intervention and post-intervention evaluations. A criterion of absolute values within the range of ±2 and ±7 was established for supposing a normal distribution (Hair et al., 2019; George & Mallery, 2024).

The estimated skewness and kurtosis values for the overall sample and each intervention group, OVRET, online EMDR flash technique, and psycho-education, remained within the allowed range of ±2.0. According to Tabaschnik and Fidell (2013), it was assumed that the scores from all data collection tools adhered to a normal distribution. The overall sample had pre-intervention FAS scores with a skewness of -1.06 and kurtosis of 0.65, but post-intervention scores revealed a skewness of 0.18 and kurtosis of -1.26. At the group level, the most excellent absolute values were observed: -1.01 skewness for pre-intervention FAS scores in the OVRET group, -1.45 kurtosis for post-intervention FAS scores in the EMDR flash group, and -1.72 kurtosis for post-intervention FAM scores in the psycho-education group.

Upon analysing the score distribution from the FAS test, the FAM test, and the VAFAS test, it was determined that the overall scores for fear of flying in both the pre-test and post-test adhered to a normal distribution. Based on the information from all tests, it was assumed that the data conformed to the assumption of normality, thus justifying the use of parametric statistical tests for further analysis. Therefore, the findings suggest that the normality assumption was not violated for any of the fear-of-flying measures, thereby supporting the use of parametric statistical analyses for subsequent investigations.

4.3. Analysis of the Flight Anxiety Situations Questionnaire (FAS) Test Scores

The following topics are addressed below: descriptive statistics and assumption checks for the Flight Anxiety Situations Questionnaire (FAS) test, mixed-design ANOVA results for the Flight Anxiety Situations Questionnaire (FAS) test, and a comparison of the Flight Anxiety Situations Questionnaire (FAS) test scores between groups.

4.3.1. The Flight Anxiety Situations Questionnaire (FAS) Test Descriptive Statistics and Assumption Checks

The descriptive statistics for the FAS test across the three groups at both pre-test and post-test are summarised in Table 4.4.

Table 4.4. Descriptive Statistics of the Pre and Post-Test of the FAS Test

	Treatment Groups	*M*	*SD*	*N*
Pretest	OVRET	111.06	29.43	18
	Flash	135.25	17.50	20
	Psychoedu	126.40	23.51	20
	Total	124.69	25.37	58
Post-test	OVRET	71.00	25.43	18
	Flash	80.00	35.36	20
	Psychoedu	103.20	33.84	20
	Total	85.21	34.32	58

Note: OVRET = Online Virtual Reality Exposure Therapy; EMDR = Eye Movement Desensitisation and Reprocessing; Psycho = Psycho-education group; FAS = Flight Anxiety Scale; FAM = Flight Anxiety Modality Test; VAFAS = Visual Analogue Flight Anxiety Scale

At the pre-test, the EMDR flash group exhibited the highest mean score (M = 135.25, SD = 17.50), followed by the psychoeducation group (M = 126.40, SD = 23.51) and the OVRET group (M = 111.06, SD = 29.43). The OVRET group started with the lowest mean pre-test score (M = 111.06, SD = 29.43), which decreased at post-test (M = 71.00, SD = 25.43). The EMDR flash technique group had the most significant pre-test anxiety (M = 135.25, SD = 17.50) and showed a significant reduction at post-test (M = 80.00, SD = 35.36). However, the psycho-education group had an intermediate pre-test score (M = 126.40, SD = 23.51), which decreased at post-test (M = 103.20, SD = 33.84). The change in group mean rank order from pre-test to post-test suggests a

possible interaction between group and time, which was further examined using mixed design ANOVA. The assumption of homogeneity of covariance matrices was tested using Box's *M* test. The result was non-significant [$F(6, 70224.61) = 1.43$, $p > .05$, $M = 9.04$], indicating that the assumption was not violated.

4.3.2. The Flight Anxiety Situations Questionnaire (FAS) Test Mixed-Design ANOVA Results

A 3 (Group: OVRET, EMDR Flash, Psycho-education) × 2 (Time: Pre-test, Post-test) mixed-design analysis of variance (ANOVA) was used to assess the impact of intervention type and time on Flight Anxiety Scale (FAS) scores. This analytical technique was used to assess between-group variations among intervention modalities, within-group changes over time, and, most importantly, whether the patterns of change over time varied across intervention groups (i.e., time × group interaction). The primary and interaction effects were evaluated using mixed-design ANOVA and Wilks's lambda (Λ).

The analysis revealed a statistically significant main effect of time [$F(1, 55) = 105.04$, $p < .001$, $\eta^2 = .656$, $\lambda = .344$]. According to Cohen's (1988) guidelines, this represents a large effect size, indicating a substantial overall decrease in scores from the pretest to the posttest across all participants. Moreover, the time × group interaction was also statistically significant [$F(2, 55) = 5.98$, $p < .05$, $\eta^2 = .179$, $\lambda = .821$], which constitutes a medium-to-large effect. The findings demonstrate a substantial decrease in anxiety levels over time for all groups, with the pattern of improvement differing across interventions, as indicated by the significant interactions. To clarify the significant time × group interaction, subsequent analyses will employ post-hoc comparisons to determine specific differences in treatment efficacy between groups.

Table 4.5. Comparison of the Average Scores Obtained from the FAS Test in the Pre-Test and Post-Test Measurements

The FAS Test						
Groups		Mean Difference	Std. Error	Sig.[b]	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
OVRET	EMDR Flash	-16.59	5.79	.29	-17.80	54.07
	Psychoedu	-13.49*	5.79	.02	-25.10	-1.89
EMDR Flash	OVRET	6.19	5.79	.29	-5.41	17.80
	Psychoedu	-7.30	5.63	.20	-18.59	3.99
Psychoedu	OVRET	13.49*	5.79	.02	1.89	25.10
	EMDR Flash	7.30	5.63	.20	-3.99	18.59

Based on estimated marginal means
*. The mean difference is significant at the .05 level.
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

4.3.3. Comparison of the Flight Anxiety Situations Questionnaire (FAS) Test Scores Between Groups

Following a significant time × group interaction, pairwise comparisons were conducted using the Least Significant Difference (LSD) post-hoc test. Pairwise comparisons revealed a statistically significant mean difference of –23.77 between the OVRET and the psychoeducation group ($p < .05$). The 95% confidence interval, which ranges from –39.47 to –8.08, supports this finding. In line with the hypothesis, these findings indicate that the OVRET intervention led to a significantly greater reduction in the measured scores compared to psycho-education, while showing comparable effectiveness to the EMDR flash technique. The estimated marginal means plot (Figure 4.2) visually supports these change trends across measurement time points. Furthermore, analyses of the one-month follow-up measurements for the OVRET group demonstrated that the gains achieved at post-test were maintained at the one-month follow-up.

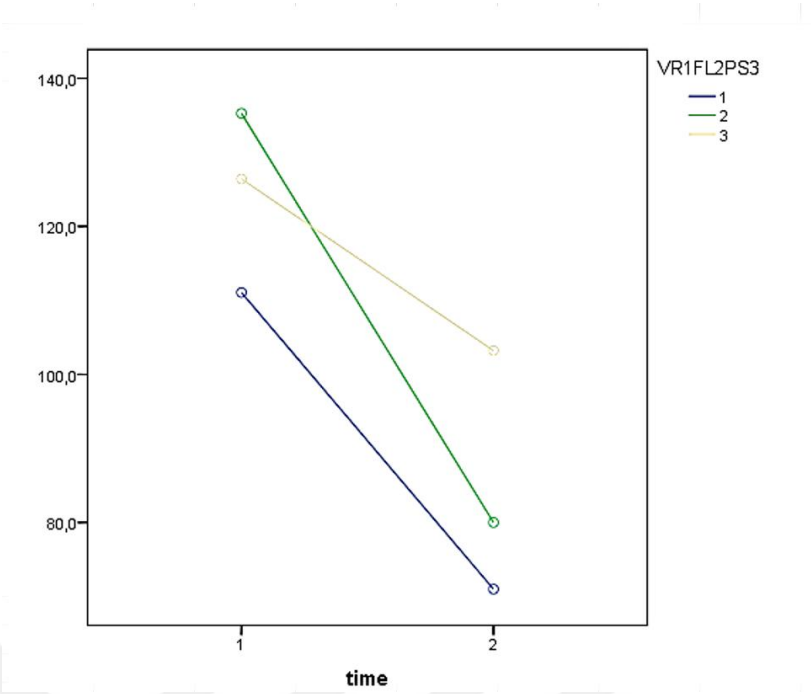


Figure 4.2. The FAS Test Scores Obtained by Groups from the Pre-Test and Post-Test

4.4. Analysis of the Flight Anxiety Modality Questionnaire (FAM) Test Scores

The following topics have been examined below: the Flight Anxiety Modality Questionnaire (FAM) test descriptive statistics and assumption checks, the Flight Anxiety Modality Questionnaire (FAM) test mixed-design ANOVA results, and the comparison of the Flight Anxiety Modality Questionnaire (FAM) test scores between groups.

4.4.1. The Flight Anxiety Modality Questionnaire (FAM) Descriptive Statistics and Assumption Checks

The analysis proceeded with scores from the FAM, which functioned as the primary outcome measure for evaluating flight-related anxiety symptoms. The findings are based on the FAM test descriptive scores that participants in three different groups (OVRET, EMDR flash, and psychoeducation) obtained on the pre-test and post-test.

Table 4.6 shows the mean (*M*) and standard deviation (*SD*) values for the FAM pre-test and post-test scores for each of the three groups. On average, post-test scores

declined compared to pre-test results for each group. In accordance with the hypothesis, the post-intervention means for both the OVRET (M = 50.72) and flash techniques (M = 58.6) were lower than the pre-intervention means for both the OVRET (M = 37.89) and flash technique groups (M = 42.4). Conversely, the post-test mean of the psycho-education group (M = 56.75) exhibited a minimal decrease relative to its pre-test mean (M = 58.85) and the overall post-test mean. To evaluate the statistical significance of the differences between the pre-test and post-test variables within each group, a mixed-design ANOVA will be implemented in the subsequent sections.

Table 4.6. Descriptive Statistics of the Pre and Post-Test of the FAM Test

	Treatment Groups	*M*	*SD*	*N*
Pre-test FAM	OVRET	50.72	17.02	18
	Flash	58.60	15.22	20
	Psychoedu	58.85	19.25	20
	Total	56.24	17.35	58
Post-test FAM	OVRET	37.89	19.40	18
	Flash	42.40	21.36	20
	Psychoedu	56.75	23.32	20
	Total	45.95	22.62	58

The assumption of homogeneity of covariance matrices was evaluated using Box's M test. The outcome was non-significant [$F(6, 70224.61) = 0.29$, $p > .05$, $M = 1.83$], suggesting that the assumption was not violated.

4.4.2. Mixed-Design ANOVA Results for the Flight Anxiety Modality Questionnaire (FAM)

A mixed-design ANOVA with three groups (OVRET, EMDR Flash, and psycho-education) and time intervals (pre-test and post-test) was conducted to evaluate how different interventions and time periods influenced scores on the FAM. This analytical technique was used to assess between-group variations among intervention modalities,

within-group changes over time, and, most importantly, whether the patterns of change over time varied across intervention groups (i.e., time × group interaction). The primary and interaction effects were evaluated using Wilks's lambda (ʌ).

The analysis demonstrated a significant main effect of time [$F(1, 55) = 25.00$, $p < .001$, $\eta^2 = .313$, $\Lambda = .687$], indicating notable reductions in anxiety scores from the pre-test to the post-test across all groups, as shown in Table 4.7. A significant time × group interaction was identified [$F(2, 55) = 5.98$, $p < .05$, $\eta^2 = .136$, $\Lambda = .864$], indicating that the pattern of change over time varied significantly among the three intervention groups. The substantial effect size for the main impact of time ($\eta^2 = .313$) and a medium effect size for the interaction ($\eta^2 = .136$) reflect the varied efficacy of treatments in alleviating flight anxiety symptoms over time. The findings demonstrate a substantial decrease in anxiety levels over time for all groups, with the pattern of improvement differing across interventions, as indicated by the significant interactions. To clarify the significant time × group interaction, subsequent analyses will employ post-hoc comparisons to determine what was found between the flash technique and psychoeducation groups ($M = -7.30$, $p > .05$).

4.4.3. Comparison of the Flight Anxiety Modality Questionnaire (FAM) Test Scores Between Groups

The mixed-design ANOVA results for intergroup comparisons revealed a statistically significant difference between groups [$F(2, 55) = 2.73$, $p < .05$, $\eta^2 = .09$]. Given the importance of the general ANOVA test, pairwise comparisons were conducted utilising the LSD (Least Significant Difference) procedure to analyse specific differences among groups. The findings indicated that, in line with the hypothesis, the OVRET group exhibited a significant decrease in values during the post-test relative to the psycho-education group ($M = 13.49$, $p < .05$). However, no significant difference was found between the OVRET and flash technique groups ($M = -6.19$, $p > .05$), consistent with anticipated results. Contrary to our hypothesis, no significant differences in treatment efficacy between groups.

Table 4.7. Comparison of the Average Scores Obtained from the FAM Test in the Pre-Test and Post-Test Measurements

The FAM Test						
Groups		Mean Difference	Std. Error	Sig.[b]	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
OVRET	EMDR Flash	-6.19	5.79	.289	-17.80	5.41
	Psychoedu	-13.49*	5.79	.023	-25.10	-1.89
EMDR Flash	OVRET	6.19	5.79	.289	-5.41	17.80
	Psychoedu	-7.30	5.63	.201	-18.59	3.99
Psychoedu	OVRET	13.49*	5.79	.023	1.93	25.10
	EMDR Flash	7.30	5.64	.201	-3.99	18.59

Based on estimated marginal means

*a. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

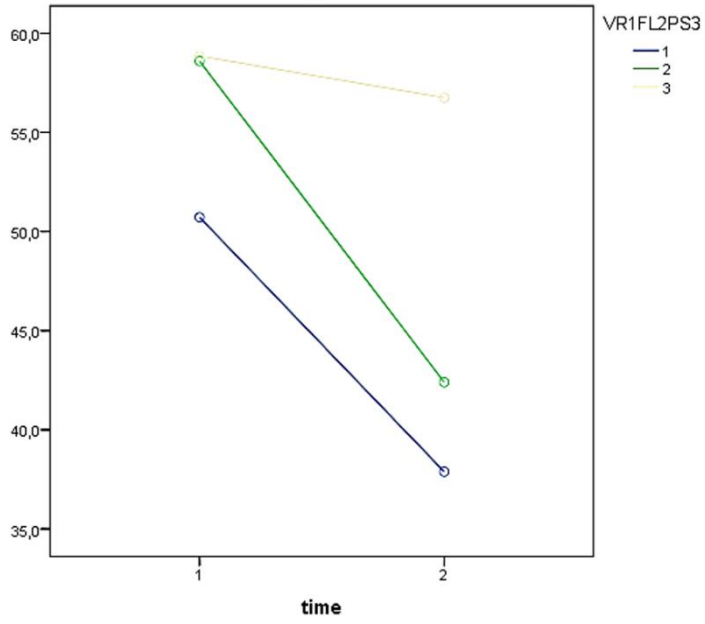


Figure 4.3. The FAM Test Scores Obtained by Groups from the Pre-Test and Post-Test

The time effect analysis of participants, comparing them before and after treatment, was performed using a mixed-design ANOVA. The analysis revealed that the FAM test results for the psychoeducation group did not show any significant variation in pre- and post-treatment scores ($p > .05$). In contrast, significant changes were observed

in the OVRET and the EMDR flash groups. In summary, it was determined that the gains were maintained one month after treatment for the FAM test.

4.5. Analysis of the Visual Analogue Flight Anxiety Scale (VAFAS) Test Scores

The following topics have been presented below: The Visual Analogue Flight Anxiety Scale (VAFAS) test descriptive statistics and assumption checks, the Visual Analogue Flight Anxiety Scale (VAFAS) test mixed-design ANOVA results, and the comparison of the Visual Analogue Flight Anxiety Scale (VAFAS) test scores between groups.

4.5.1. The VAFAS Test Descriptive Statistics and Assumption Checks

The descriptive statistics for the VAFAS scores are presented in Table 4.8. On average, post-test scores declined compared to pre-test results for each group. In accordance with the hypothesis, the post-intervention means for both the OVRET (M = 4.94) and the flash techniques (M = 5.3) were lower than the pre-intervention means for both the OVRET (M = 7.78) and the flash technique groups (M = 7.65). Conversely, the post-test means of the psycho-education group (M = 7.6) exhibited a minimal decrease relative to its pre-test mean (M = 8.25) and the overall post-test mean. A mixed-design ANOVA will be used to assess the statistical significance of the differences between the pre-test and post-test variables within each group.

Table 4.8. Descriptive Statistics of the Pre and Post-Test of the VAFAS Test

	Groups	*M*	*SD*	*N*
VAFAS Pre-Test	OVRET	7.78	2.29	18
	EMDR Flash	7.65	1.60	20
	Psychoedu	8.25	1.62	20
	Total	7.90	1.83	58
VAFAS Post-test	OVRET	4.94	2.578	18
	EMDR Flash	5.30	2.75	20
	Psychoedu	7.60	2.33	20
	Total	5.98	2.78	58

Before the primary analysis, the assumption of homogeneity of covariance matrices was tested using Box's *M* test. The result was non-significant, [$F(6, 70224.61) = 1.06$, $p>.05$, $M = 6.72$], indicating that the assumption was not violated.

4.5.2. The VAFAS Test Mixed-Design ANOVA Results

A mixed-method design ANOVA was conducted to assess the differences in flight anxiety levels among individuals with aviophobia, utilising the VAFAS test prior to intervention and one-month post-intervention. The statistical findings about the significant effects of time, group, and their interaction ($p> .05$). The analysis indicated statistically significant results for the group effect [$F(2, 55) = 3.98$, $p < .005$, $\eta^2 = .13$], the time effect [$F(1, 55) = 24.36$, $p < .001$, $\eta^2 = .44$], and the time × group interaction effect [$F(2, 55) = 24.36$, $p < .001$, $\eta^2 = .44$] as seen in Table 4.9. The results indicate that OVRET and EMDR flash groups experienced a significant decline at post-treatment, while the psycho-education group scores remained relatively stable.

Table 4.9. Comparison of the Average Scores Obtained from the VAFAS Test in the Pre-Test and Post-Test Measurements

Measure						
Intervention	Groups	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
OVRET	EMDR Flash	-.114	.627	.857	-1.37	1.14
	Psychoedu	-1.56*	.627	.016	-2.82	-.308
EMDR Flash	OVRET	.114	.627	.857	-1.14	1.37
	Psychoedu	-1.45*	.610	.021	-2.67	-.227
Psychoedu	OVRET	1.56*	.627	.016	.308	2.82
	EMDR Flash	1.45*	.610	.021	.23	2.67

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

4.5.3. Comparison of the Visual Analogue Flight Anxiety Scale (VAFAS) Test Scores Between Groups

Least Significant Difference comparisons were performed to identify differences among groups, indicating a significant difference between the pre-test and post-test ($p < .05$). Analysis of the pre- and post-treatment score distributions for the FAM test revealed no changes in the flash and psycho-education group, as seen in Figure 4.4. In contrast, a reduction in flight fear and anxiety symptoms was noted in the OVRET group over time [$F(1, 55) = 43.65$, $p < .01$, $\eta^2 = .13$]. In summary, the OVRET and EMDR flash groups showed lower test results following the intervention, whereas the psychoeducation group remained relatively stable. This demonstrates the existence of a group x time Interaction.

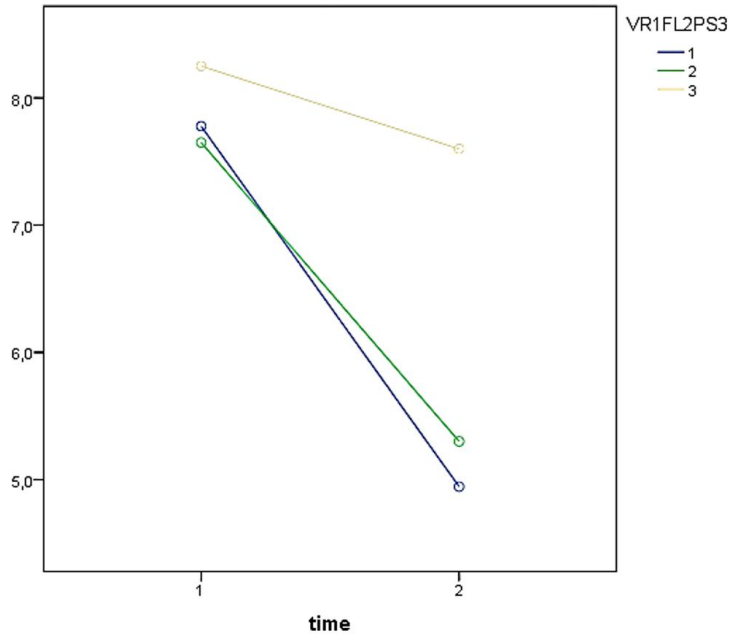


Figure 4.4. The VAFAS Test Scores Obtained by Groups from the Pre-Test and Post-Test

The time effect analysis of participants, comparing them before and after treatment, was performed using a mixed-design ANOVA. The analysis revealed that the VAFAS test results for the psychoeducation group did not show any significant variation in pre- and post-treatment scores ($p > .05$). In contrast, significant changes were observed

in the OVRET and flash groups. In summary, it was determined that the gains were maintained one month after treatment for the VAFAS test.

4.6. Analysis of the Flight Experience Scores

The following topics are outlined below: descriptive statistics and assumption checks for the Flight Experience Scores, as well as the mixed-design ANOVA results for the Flight Experience Scores.

4.6.1. The Flight Experience Descriptive Statistics and Assumption Checks

The descriptive statistics for flight experience are presented in Table 4.10. On average, post-test scores declined compared to pre-test results for each group. A mixed-design ANOVA will be used to assess the statistical significance of the differences between the pre-test and post-test variables within each group.

Table 4.10. Descriptive Statistics of the Pre and Post-Test of the Flight Experience

Flight experience								
	N	M	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
OVRET	18	.389	.502	.12	.139	.638	.0	1.0
EMDR Flash	20	.400	.503	.11	.165	.635	.0	1.0
Psychoedu	20	.150	.366	.08	-.021	.321	.0	1.0
Total	58	.310	.467	.06	.188	.433	.0	1.0

The normality of the flying experience variable was validated, with skewness and kurtosis values within acceptable parameters for a normal distribution (skewness = 0.84; kurtosis = -1.34), in accordance with Tabachnick and Fidell (2013).

4.6.2. The Flight Experience ANOVA Results

A one-way analysis of variance (ANOVA) was used to investigate whether flying experience affected post-treatment avoidance behaviour scores. The results showed no significant difference in avoidance behaviour scores between the experience groups [$F(2,55) = 1.859$, $p > .05$], as seen in Table 4.11. Based on this finding, the presence or severity of flight avoidance behaviour does not differ across intervention groups.

Table 4.11. Comparison of the Average Scores Obtained from Flight Experience

ANOVA					
Flight Experience					
	Sum of Squares	*df*	Mean Square	*F*	*p*
Between Groups	.786	2	.393	1.859	.165
Within Groups	11.63	55	.211		
Total	12.41	57			

CHAPTER V

DISCUSSION

This section presents the primary findings of the study and their relevance to the existing literature. Initially, we will examine the impact of online single-session OVRET and EMDR flash techniques on aviophobia and compare their effectiveness. The socio-demographic characteristics of the sample group and their impact on treatment outcomes will be assessed. This study will address its strengths and limitations, concluding with implications for future research and the aviation industry. This chapter presents the study's overall results and their practical applications.

5.1. Socio-Demographic Characteristics

The present section of the discussion focuses on the socio-demographic characteristics of the sample group, comprising 62 participants. When the sample group was evaluated by gender, it was determined that 48 of the 62 participants were female (77.4%) and 14 were male (22.6%). This distribution aligns with existing literature; for instance, a systematic review of 55 U.S. anxiety studies (*N = 4,492 participants)* revealed a predominant enrollment of female participants. According to this review, women made up 62.2% of participants in randomised controlled psychotherapy studies for anxiety disorders, with men clearly the minority (Ong et al., 2024). Similarly, an article addressing gender balance, representativeness, and statistical power in studies utilising undergraduate samples indicates that women are more likely to participate in psychology studies than men (Dickinson et al., 2012).

The gender distribution among the groups revealed 13 females (21%) and six males (9.7%) from a total of 19 participants in the OVRET group. In comparison, the flash group consisted of 19 females (30.6%) and three males (4.8%) out of 62 participants. In comparison, the psychoeducation group consisted of 16 female participants (76.2%) and five male participants (23.8%).

Specific phobias have been demonstrated to be two to three times more prevalent among women, especially for subtypes of specific phobias such as aviophobia, as a situational phobia (Kessler et al., 2005). According to Laker and colleagues (2024), a notable percentage of participants in the study who reported aviophobia were women. The statistical analysis revealed that female participants exhibited a greater prevalence and severity of aviophobia symptoms in comparison to male participants. Women's inclination to seek treatment could potentially explain the gender disparity in treatment application. Understanding gender disparities is crucial to developing effective therapy strategies. Treatment outcomes for both men and women may be improved by interventions that consider coping mechanisms and vulnerabilities unique to each gender (Hallers-Haalboom et al., 2020). Future studies can plan for a more equal gender distribution to observe potential differences in treatment effects.

The minimum age for inclusion criteria is often set at 18 in studies with adults, as documented in the literature (Moldovan & David, 2014; Wiederhold et al., 2001, 2002, 2003). A randomised controlled study demonstrating the long-term effectiveness of fully automated mobile VR-CBT therapy administered in a natural environment in reducing symptoms of aviophobia (Donker et al., 2023). When the sample group is evaluated based on the age variable, the inclusion criteria for the participants in Donker et al.'s (2023) study were 18-64 years of age. Similarly, the age range of 18 to 65 years was used in the current study. Participants ranged in age from 21 to 65, with a mean age of 37 years (*SD* = 10.2). Similarly, the average age in a retrospective study of aviophobia using VRET was 43.9 years (*SD* = 13.3), as reported by Gottlieb et al. (2021). This value indicates a moderate degree of age variability and a relatively young sample group. According to Fredrikson and colleagues (1996), there was an age-related increase in women's aviophobia, but no such variation for men. Subsequently, phobias and specific anxieties vary in prevalence among age groups and genders (Fredrikson et al., 1996). Therefore, it is anticipated that the demand for flights may be greater during this age range, as it is characterised by a high level of activity in both work and social life.

Regarding their flying status, 58 participants had experience, whereas 4 had no flying experience at all in the present study. According to the present study, tThe prevalence of aviophobia is comparable between individuals with flight experience and those

without any flying history in the present study. There was no significant difference in the percentage of people who were afraid of flying between those who had flown in the past three years and those who had never flown (Oakes & Bor, 2010). Although the participants had varying levels of flight experience, the present study found no significant difference in the results, which is consistent with the existing literature. Moreover, 32 people attempted to control their aviophobia by sleeping, viewing screens, reading, conversing, or playing games (61.3%). Another two people (3.2%) used medication for their fear. Several randomised controlled trials indicated that a significant number of individuals with a fear of flying preferred to avoid air travel (Campos et al., 2019; Rothbaum et al., 2000). According to Foreman and colleagues (2006), clients with aviophobia typically avoid aeroplane travel completely, and the rate of coping by avoiding the flight was 35.5% in our study.

5.2. Online Single-Session OVRET and EMDR Flash Technique in Overcoming Aviophobia

This section will examine the impact of the OVRET and the EMDR flash technique protocols on aviophobia. Aviophobia is recognised as a specific phobia that involves an intense fear of flying, leading to avoidance behaviours and considerable distress or impairment in daily functioning (Abuso et al., 2025). Aviophobia leads many individuals to deliberately avoid flying, potentially disrupting their employment, social interactions, and daily routines. Although some people may be able to fly, it may be challenging or require the use of ineffective coping techniques such as medication or alcohol (van Gerwen et al., 2018).

Cognitive Behavioural Therapy (CBT) and Eye Movement Desensitisation and Reprocessing (EMDR) are among the most prevalent and effective intervention modalities for aviophobia (Busscher & Spinhoven, 2016; Krijn et al., 2007; Triscari et al., 2015). CBT offers a strong theoretical foundation, establishing itself as a gold standard (Kahan et al., 2000). Despite CBT's effectiveness in treating aviophobia, access to treatment and the process of treatment are complicated by several issues, including the high cost of in vivo exposure, high dropout rates, and time restrictions (Rothbaum et al., 2006). On the other hand, there are contemporary and functional methods that offer alternatives to standard treatment methods in terms of accessibility

and sustainability, such as EMDR and VRET (Triscari et al., 2015; Wiederhold et al., 2001). Major obstacles to the treatment of aviophobia include the cost of psychotherapy, the distance to the psychotherapy centre, the absence of a qualified psychotherapist, long treatment duration, and the difficulty of scheduling an appointment (Rothbaum et al., 2006; Wiederhold et al., 2002). Therefore, readily available, broadly accessible, short-term, and goal-oriented therapy methods are gaining popularity as a viable alternative treatment option, particularly in the global literature.

There are few studies on single-session phobia treatments in the existing literature. For instance, Odgers et al. (2022) conducted a meta-analysis comparing single-session and multi-session psychotherapy, which showed that the two methods were equally effective and that single-session therapies were much more time-efficient. Furthermore, a single session of VRET, regardless of motion simulation, markedly reduced the fear of flying, with benefits sustained at six months afterwards (Mühlberger et al., 2003). Similarly, a single in-flight EMDR session was found to be effective in alleviating a client's non-traumatic fear of flying, as reported in a case study (Newgent et al., 2006). Nevertheless, the national and international literature demonstrates a limited number of studies on aviophobia that utilise online single-session protocols, and their application is not widespread (Mühlberger et al., 2003; Newgent et al., 2006).

The literature review revealed that while a limited number of single-session VRET interventions for aviophobia are present, there is an absence of studies focusing on online single-session VRET interventions. In a similar vein, while there is currently a restricted number of single-session or online flash technique interventions targeting various mental health issues, no studies specifically addressing the flash technique for aviophobia were identified (Lenferink et al., 2020; Mühlberger et al., 2003; Yaşar et al., 2021).

The overarching goal of this thesis is to design and test two online, single-session intervention protocols grounded in CBT and EMDR, without incorporating relaxation or breathing exercises, and to compare their efficacy. Within this framework, a protocol for single-session OVRET therapy and a protocol for online flash technique

were established and tested in comparison to a group that received simply psycho-education to determine the efficacy of the programs. The prescribed protocols comprise organised techniques that attempt to focus on the underlying cognitive and behavioural components of aviophobia from a CBT perspective, as well as traumatic experiences related to aviophobia from an EMDR perspective.

Muhlberger and colleagues (2001) conducted a study in which VRET was employed as a single-session intervention. Participants were randomly assigned to one of three groups: one that received cognitive intervention along with VR exposure that included motion simulation, one that had VR exposure without motion simulation, or one that received only cognitive intervention. The findings demonstrated that only the groups exposed to VR (with or without motion simulation) had a substantial reduction in fear of flying both immediately after treatment and at the 6-month follow-up. The study presented the beneficial role of VRET in reducing flight-related anxiety, regardless of the type of motion simulation used. Similarly, online VRET is equally effective in reducing flight-related anxiety as other treatments like CBT. Online VRET has been shown to reduce avoidance behaviour, fear, and flight anxiety dramatically (Mor et al., 2022).

In the present study, statistical analyses were conducted to examine the differences that would occur after one month of interventions, and participants were requested to perform an actual flight to assess avoidance behaviour. In line with the literature, the present OVRET group participants engaged in techniques to identify cognitive distortions that provoke anxiety, acquired knowledge about the structure of anxiety and fear of flying, and practised desensitisation techniques through VR exposure to flying, all within a single session. The OVRET protocol did not include any relaxation or breathing exercises. It also aims to observe the effects of these two protocols without any confounding factors.

The EMDR flash technique has shown promise as a quick and non-invasive alternative to traditional therapeutic methods for processing unpleasant memories. This method considerably improves post-treatment outcomes, lowering avoidance, intrusion, anxiety, and symptoms of post-traumatic stress (Manfield et al., 2024). Newgent and colleagues (2006) used a single-session EMDR treatment on a client who had a

nontraumatic phobia of flying. The session took place on an actual aircraft, providing a realistic setting for the therapy. Researchers recorded post-treatment assessments over 21 months to determine the treatment's long-term effectiveness, and the client reported flying 24 times with no relapse. Similarly, in the present flash technique protocol, participants gained the structure of anxiety and aviophobia, identified positive engaging focus (PEF), desensitised flight-related disturbing memories using the flash technique, and prepared for future flight programs within a future template.

The current EMDR flash technique protocol did not include any relaxation or breathing exercises to match the experimental conditions for the OVRET and flash technique groups. It also aimed to control for confounding variables for the two protocols. Thus, the focus of the present investigation is to address the challenges associated with obtaining therapy and to enhance the comfort of flight experiences for individuals with aviophobia by providing a practical, short-term, and remotely accessible intervention.

The first hypothesis is “Single-session OVRET intervention decreases fear, anxiety levels and avoidance behaviours for fear of flying compared to the psycho-education only group at posttreatment”. Based on these results, the first hypothesis has been confirmed. The results of the present study showed that the OVRET and EMDR flash technique groups performed significantly better than the psychoeducation group, as assessed by the Visual Analogue Flight Anxiety Scale (VAFAS), which evaluates an individual's general level of aviophobia. As anticipated, the OVRET and flash technique groups did not show significant differences in efficacy according to the VAFAS line, supporting hypothesis 3a. However, the analysis yielded conflicting outcomes. The results demonstrated that the OVRET group showed a significant reduction in scores on the Flight Anxiety Situations Questionnaire (FAS) and the Flight Anxiety Modality Questionnaire (FAM) during the post-test compared to the psychoeducation group. Only the 1d hypothesis “The participants of the OVRET group make a real flight after the intervention” has not been met. This situation has also been discussed in detail.

The second hypothesis was “Single-session online flash technique intervention will decrease fear, anxiety levels and avoidance behaviours for fear of flying compared to

the psycho-education only group at posttreatment". Based on these results, the second hypothesis has been partially confirmed. The hypothesis 2c "The participants of the flash technique group have lower scores of VAFAS compared to the psycho-education only group at posttreatment" has been confirmed. However, the hypotheses 2a, 2b, and 2d "The participants of the online flash technique group have lower scores of the FAS and the FAM test compared to the psycho-education only group at posttreatment. The participants of flash technique group make a real flight after the intervention" were not met.

In contrast to our Hypothesis 2, no substantial difference was observed between the flash technique and psychoeducation groups, as measured by the FAS and FAM tests, while the OVRET was effective. In the present study, several possible factors may explain the observed difference between the OVRET and flash groups. This difference may suggest that the flash technique emphasises cognitive-level apprehensive responses to flight-related situations, rather than emotional or physiological responses (e.g., panic, physical arousal). The mechanisms of the flash technique emphasise more emotional arousal and physiological stress levels, explaining the difference. The mechanisms of the flash technique emphasise more emotional arousal and physiological stress levels, explaining the difference. According to the research, the flash technique is effective in reducing the discomfort level of traumatic memories, as well as the emotional intensity and physiological arousal associated with memories (Brouwers et al., 2021; Manfield et al., 2022, 2024). The flash technique reduces emotional distress without requiring extensive cognitive processing by focusing on 'minimal conscious focus' on fear or traumatic memories (Manfield et al., 2024; Manfield et al., 2022). So, the flash technique may not contribute to substantial cognitive reappraisal in this circumstance. This observation does not constitute conclusive evidence; instead, it proposes a testable hypothesis that requires further investigation. Breathing and relaxation exercises are incorporated into the EMDR and Flash methods, as established by Shapiro (2018) and Manfield et al. (2017). The variation may not have been noted due to the divergent core mechanisms underlying the operation of VR and EMDR approaches. Furthermore, while the intervention in VRET therapy is more intensive and develops systematically through the VR system, the higher human aspects and therapist skills required in the Flash approach, compared to VR, may be an additional obstacle.

Moreover, physiological arousal—including heart rate, sweating, and vestibular sensations—naturally occurs in VR settings, facilitating emotional processing through exposure. The VR software used in this study also incorporated variables for heart rate and breathing rate. To standardise conditions across groups, exercises such as breathing and muscle relaxation were intentionally excluded from regulation, which may have allowed for full physiological activation in the VR condition. Consequently, the difference observed in this study may be explained by the sensory richness, physiological arousal, and behavioural testing opportunities provided by OVRET, all of which promote emotional processing and long-term learning. In contrast, the flash technique, which operates with lower arousal levels and more indirect processing, may have a limited impact on fear expectations and cognitive distortions.

There have been several differing views on the importance of relaxation and breathing exercises in aviophobia treatment. According to Wiederhold and colleagues (2001), breathing exercises and relaxation techniques are crucial components of VRET for fear of flying, as they help clients manage their anxiety prior to exposure sessions, thereby enhancing their ability to handle flight stimuli and increasing the overall efficacy of therapy. In contrast, according to Shiban and colleagues (2017), combining breathing and relaxation techniques with VR therapy exposure did not impact treatment results. The purpose of the present research was to evaluate the effects of VR exposure and the flash technique alone; therefore, relaxation techniques, breathing exercises, and muscular relaxation were not included in the scope of the experiment. A noteworthy aspect of the OVRET results is that significant clinical improvement was achieved without the use of auxiliary anxiety-management techniques, such as breathing exercises or muscle relaxation, underscoring the efficacy of the primary treatment in independently reducing persistent fear across all assessment metrics.

Surprisingly, the flash technique groups show a significant decrease in the VAFAS test but no effect on the FAS or the FAM test. The variations in outcomes between the OVRET and the flash technique on the evaluation measures indicate distinctive mechanisms of action. The considerable effectiveness of OVRET across all measurements corresponds with its theoretical basis, as it directly addresses the fear structure through systematic and controlled exposure. This finding suggests that the flash technique may be effective in reducing overall flight anxiety (e.g., bodily fear

reactions, perceived danger) but has limitations in enhancing cognitive evaluations of specific flight-related events. Prior studies indicate that the flash technique primarily facilitates emotional desensitisation rather than cognitive change (Brouwers et al., 2021). In contrast, VRET has been shown to promote both anxiety reduction and cognitive restructuring by providing immersive, repeated exposure to feared stimuli (Carl et al., 2019; Powers & Emmelkamp, 2008). Thus, the difference may reflect that the flash technique targets emotional reactivity, whereas the OVRET engages both emotional and cognitive processing mechanisms. This finding indicates the need for the development of multicomponent intervention models for future research. Additionally, because the flash technique does not require any technical instruments or software, it is significantly less expensive, applicable and easier to implement than VRET.

Furthermore, a small sample size should be regarded as a methodological amplifier of this impact. Smaller samples have lower statistical power to detect moderate effects, particularly on measures that are less sensitive to fast change (such as cognitive beliefs). This could account for the fact that the flash technique's potentially more subtle impact on the FAS and FAM failed to attain statistical significance.

The hypothesis 3 “The single-session OVRET and the online EMDR Flash interventions are equally effective in reducing participants’ fear, anxiety levels and avoidance behaviours for fear of flying from pretest to post-test.” has not been met—the number of actual flights within one month after the intervention was used to assess avoidance level. The distribution of frequencies and cumulative percentages of flight events is shown in Table 4.10. Among all participants, 20 (32.3%) reported having flight experience. Four weeks after the treatment, 12.9% (n = 8) of the OVRET group, 14.5% (n = 9) of the flash technique group, and 4.8% (n = 3) of the psycho-education group completed flights. These findings indicate that, while some participants took actual flights following the intervention, the majority remained avoidant, with low rates of post-treatment flight.

Despite substantial increases in the FAS, FAM, and VAFAS tests, avoidance levels did not decrease statistically. Similar practices and results are also found in the literature. For example, in a study conducted by Rus-Calafell and colleagues (2013),

participants were asked to perform a real flight within 15 days after treatment. However, the number of participants who performed flights according to the groups was not found to be statistically significant. There could be various possible explanations. The first possible explanation is that flight tickets are not provided for participants due to financial limitations. The participants were instructed to book flights and travel to any destination within one month. Feedback from participants identified key obstacles, including overloading on planes, flight ticket prices, and schedule problems, which align with the literature regarding participants' own agendas.

Similarly, the study by Cardoş and colleagues (2019) indicated that participants were to take an actual flight within two weeks after the intervention. However, they may plan it according to their availability, suggesting that personal factors influenced their decision not to fly. In the present study, while the OVRET and other psychological interventions can dramatically reduce flight anxiety, they may also cause anxiety that prevents many people from flying shortly after treatment. In summary, the long-term treatment efficacy could not be measured in the present study because the post-treatment evaluation was conducted only one month after treatment. This research emphasises the need for not only the emotional/cognitive aspects of treatment but also support structures that stimulate behavioural action.

5.3. Strengths of the Research

This thesis comparatively analysed two different short-term psychotherapy methods (OVRET and the EMDR flash technique) for the treatment of aviophobia. The single-session model was chosen for its methodological rigour in directly comparing the fundamental processes of OVRET and the flash technique, while eliminating the confounding variable of treatment duration that exists in multi-session protocols (Öst, 1989). This strategy effectively addresses a significant public health challenge by overcoming established obstacles to treatment—such as cost, time, and geographical limitations—that prevent persons with specific phobias from obtaining therapy (Kazdin & Blase, 2011). Consequently, the single-session approach represents a scientifically acceptable and pragmatically essential advancement in enhancing the availability and accessibility of evidence-based therapies.

This topic is rarely studied in the literature, and a direct comparison of the effectiveness of different techniques can contribute to informed clinical decision-making. By investigating the effects of structured, single-session therapies, the present study has contributed to the development of sustainable, time- and cost-effective solutions. This work is especially valuable in providing practical therapy options for individuals who are busy working or travelling. The effectiveness of the flash technique was systematically analysed for the first time in the context of aviophobia, making a new and original contribution to the limited number of studies on this technique. Similarly, although there are few single-session OVRET studies, this study was the first to apply OVRET online, making an important contribution to the field.

One of the strengths of the present study is its methodological rigour. To ensure scientific robustness, all participants were randomly assigned to treatment groups using a random number generator. In addition, protocol manuals were prepared to standardise the protocols, with each step clearly defined. Even the telephone calls used in the therapist-client relationship were standardised for protocol standardisation. Furthermore, to minimise therapist influence on the treatment, all therapists were expert psychologists with the same qualifications. Those applying VRET were required to have a CBT certificate, and those applying the flash technique were required to have two-level EMDR training. To ensure fidelity, therapists underwent three months of training, after which one-to-one supervision studies were carried out to ensure adherence to the protocol before proceeding with the intervention.

The study used only standard quantitative measures. Single-session treatments for aviophobia using single-session online VRET and the EMDR flash technique show promising results. It is predicted that, in the future, both online single-session VRET and the flash technique will become more widely used for aviophobia treatment.

5.4. Limitations

This study may have encountered several constraints and obstacles. Initially, the internet quality occasionally resulted in communication disruptions for both the experimental groups and the psycho-education group, as the study was conducted online. Internet disconnections may have caused both therapist and client to focus on

the connection problems, thus shifting the focus from the therapy to the communication problem. Furthermore, the technology of VR devices that are compatible with smartphones is straightforward. The sequences are more like cartoons, with each scene demonstrating the process rather than a whole flight scenario. OVRET's efficacy can be enhanced by implementing more realistic technologies, such as the metaverse, high-quality VR helmets, and advanced technological systems like hydraulic seats.

The small sample size is another limitation of the research. The effectiveness of the treatment in terms of both performing analyses and demonstrating the study's effect is more effectively tested when a large sample size is used in randomised controlled trials. Despite reaching the anticipated number of participants and conducting the first interview with 92 individuals, approximately 30 individuals withdrew from the study after the first interview for various reasons, including scheduling difficulties, problems accessing their contact information, or personal preferences not to participate. The size and demographic diversity of the existing sample were constrained; therefore, to improve generalisability, future studies should include larger, more representative samples. To mitigate the impact of this limitation on the treatment, a comparable number of participants were enrolled in each group, despite the current circumstances. Moreover, inclusion of objective outcomes (e.g., physiological measures) and actual flight would be recommended to increase effectiveness. It should be reframed to emphasise that the results are exploratory and require replication in larger, rigorously designed trials.

Furthermore, the treatment groups and the control group had different session durations. The online sessions in the OVRET and the EMDR flash groups lasted 180 minutes each, whereas the control group sessions lasted only 50 minutes. Time spent with the therapist could be a factor in this situation. To minimise this limitation, the initial telephone interview with the control group was conducted simultaneously with the experimental group, using the same set of questions. Thus, to administer the same treatment to the participants ethically, the control group participants were scheduled for two additional hours of therapy after the one-month post-treatment period, and the treatment procedures were completed. Another limitation of the current study is the high attrition rate, with 27% to 38% of the original participant population failing to

complete the final assessment. The stated participant dropout rate is consistent with findings from other studies on therapies for fear of flying. While Van Gerwen and colleagues (2003) reported attrition rates ranging from 26% to 41% in a CBT group therapy, Rothbaum and colleagues (2000) reported a dropout rate of up to 35% in a VRET study. Thus, the attrition rate in this study exemplifies a common methodological difficulty in this research area.

The potential confounding effect of conducting the study by seven different therapists presents another limitation. To avoid this confounding impact, therapists with similar training and experience were recruited, trained and supervised in research for three months. Additionally, fidelity assessments were conducted to ensure that each therapist adhered to the protocols for their respective intervention. Hence, it is believed that demonstrating the protocol's efficacy, regardless of the therapists' unique characteristics, will help it become a gold standard protocol. Additionally, participants were requested to organise an individually scheduled flight within one month of finishing the treatment. Some participants, however, reported that they were unable to book a flight within a month due to personal schedule conflicts. Some individuals purchased plane tickets for later months due to factors such as expensive airfares during peak vacation periods or high job intensity. More flexible time intervals and aeroplane tickets should be supplied in future trials to address individual differences and eliminate avoidance behaviour.

5.5. Implications and Future Directions

This research examines the comparative effectiveness of two brief psychotherapeutic interventions, single-session OVRET and the online EMDR flash technique, in alleviating flight-related anxiety. The findings exhibit substantial implications for the individuals, future research, and the aviation sector. This study demonstrates the effectiveness of both the EMDR flash technique and the OVRET, making them particularly valuable for individuals. Individuals can learn about faster and more successful therapies, as well as a positive approach to treating aviophobia, without requiring many sessions. The findings indicate that both OVRET and the EMDR flash technique yield notable short-term reductions in flight-related anxiety symptoms, underscoring their viability as efficient and economical interventions in clinical

practice. This is especially pertinent for individuals who need quick symptom relief, such as frequent flyers or aviation professionals.

Additionally, both the client and the therapist greatly benefit from the single-session option offered by online sessions. The study's online efficacy allows participants to receive help remotely. Future research could extend the scope of single-session treatments by applying comparable protocols to other specific phobias or trauma-related disorders, since the methodology is not restricted to aviophobia. Further research is required to determine the most effective psychological traits for various treatments and to assess the impact of aviophobia on treatment outcomes. This will enhance the utility of future interventions.

The study's contributions have both practical and strategic implications for the aviation sector, focusing on enhancing passenger satisfaction, ensuring flight safety, and driving service innovation. Airlines suffer operational problems and financial losses due to flight phobia. The study demonstrates that single-session OVRET and the flash technique reduce aviophobia, presenting opportunities for airlines, airport services, and aviation psychology units to enhance passenger psychological readiness. So, airlines can offer short-term and evidence-based services, such as single-session online VRET or EMDR-based therapies, to travellers who have aviophobia. Furthermore, airlines can improve these passengers' flight experiences while optimising their operational processes and staff responsibilities. Passengers can access therapeutic content before boarding or during long-haul flights with VRET, which can be integrated into airport lounges, smartphone apps, or in-flight entertainment systems. As a result, airlines have a better chance of assisting passengers in enhancing resilience and overcoming aviophobia, attracting more customers, and growing their share of the flight-on-demand market.

Aviophobia was present in 150 out of 1,101 psychiatric evaluations (approximately 13.6%) of aircrew members between 1985 and 2002, suggesting a significant prevalence within this occupational group. There was a significantly higher incidence of the condition among non-pilot crew members (62.6%) rather than pilots (37.4%) (Medialdea & Rios Tejada, 2005). The data indicate that aviophobia constitutes a significant and neglected risk factor that also affects the flight crew. Therefore, future

research should focus on addressing and supporting flight crews' fear of flying, incorporating them into Crew Resource Management (CRM) training where appropriate. The same therapeutic interventions could be implemented in occupational health programs for flight crew members or trainee pilots who are experiencing subclinical flight anxiety. Such assistance may raise performance, diminish medical disqualifications, and enhance crew safety and resilience.

Airlines may establish partnerships with aviation psychologists, research institutions, and digital health companies to jointly create personalised intervention modules for passengers and employees, thereby ensuring clinical integrity and accessibility. Moreover, research indicated that 25% of the individuals diagnosed with aviophobia had experienced aircraft accidents, either personally or through acquaintances. This highlights the need for aircrew members to be conscious of their own history of trauma as a possible precipitating factor in the onset of phobic reactions (Medialdea & Ríos Tejada, 2005). Numerous emergencies and catastrophic events characterise the aviation industry. Accidents or stressful experiences during flights or aviation operations may also be common. Hence, airlines must offer necessary support to their traumatised employees and conduct follow-ups after incidents.

REFERENCES

Abuso, A., Hashmi, M., Hashmi, H., Khoo, A., & Parsaik, A. (2023). Overcoming Fear of Flying: A Combined Approach of Psychopharmacology and Gradual Exposure Therapy. *Cureus, 15*. https://doi.org/10.7759/cureus.39773

Abrebak, H., Chamsi, F. Z., Essafi, A., Taqui, A., Radi, S., & El ammouri, A. (2023). EMDR as a treatment option for conditions other than PTSD. *European Psychiatry, 66*(S1), S115. https://doi.org/10.1192/j.eurpsy.2023.312

Akyol, Ç. Ç., & Inci Izmir, S. B. (2025). Exploring the impact of Flash technique on test anxiety among adolescents. *Clinical Child Psychology and Psychiatry, 0*(0). https://doi.org/10.1177/13591045251329437

Alting van Geusau, V. V. P., de Jongh, A., Nuijs, M. D., Brouwers, T., Moerbeek, M., & Matthijssen, S. J. M. A. (2023). The effectiveness, efficiency, and acceptability of EMDR vs. EMDR 2.0 vs. the Flash technique in the treatment of patients with PTSD: study protocol for the ENHANCE randomized controlled trial. *Frontiers in Psychiatry, 14*, 1278052. https://doi.org/10.3389/fpsyt.2023.1278052

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

American Psychological Association. (n.d.). Anxiety. In *APA dictionary of psychology*. Retrieved November 9, 2022, from https://dictionary.apa.org/anxiety

American Psychological Association. (n.d.). Fear. In *APA dictionary of psychology*. Retrieved November 15, 2022, from https://dictionary.apa.org/fear

Andersson, G., & Titov, N. (2014). Advantages and limitations of Internet-based interventions for common mental disorders. *World Psychiatry, 13*(1), 4–11. https://doi.org/10.1002/wps.20083

Andersson, G., Waara, J., Jonsson, U., Malmaeus, F., Carlbring, P., & Öst, L.-G. (2013). Internet-based exposure treatment versus one-session exposure treatment of snake phobia: A randomized controlled trial. *Cognitive Behaviour Therapy, 42*(4), 284–291. https://doi.org/10.1080/16506073.2013.844202

Andrews, G., Basu, A., Cuijpers, P., Craske, M. G., McEvoy, P., English, C. L., & Newby, J. M. (2018). Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: an updated meta-analysis. *Journal of anxiety disorders*, *55*, 70-78.

Andrews, G., Cuijpers, P., Craske, M. G., McEvoy, P., & Titov, N. (2010). Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis. *PloS one*, *5*(10), e13196.

Antony, M. M., & Barlow, D. H. (1998). Specific phobia. In *International handbook of cognitive and behavioural treatments for psychological disorders* (pp. 1-22).

Armfield, J. M. (2006). Cognitive vulnerability: A model of the etiology of fear. *Clinical Psychology Review, 26*(6), 746–768. https://doi.org/10.1016/j.cpr.2006.03.007

Askew, C., Dunne, G., Özdil, Z., Reynolds, G., & Field, A. P. (2013). Stimulus fear-relevance and the vicarious learning pathway to childhood fears. *Emotion, 13*(5), 915–925. https://doi.org/10.1037/a0032994

Askew, C., & Field, A. P. (2007). Vicarious learning and the development of fears in childhood. *Behaviour Research and Therapy, 45*(11), 2616–2627. https://doi.org/10.1016/j.brat.2007.06.008

Askew, C., & Field, A. P. (2008). The Vicarious Learning Pathway to Fear 40 Years On. *Clinical Psychology Review, 28*(7), 1249–1265. https://doi.org/10.1016/j.cpr.2008.04.003

Askew, C., Kessock-Philip, H., & Field, A. P. (2008). What happens when verbal threat information and vicarious learning combine? *Behavioural and Cognitive Psychotherapy, 36*(4), 491–505. https://doi.org/10.1017/S1352465808004418

Aviation Health. (2024). Beta-blockers in flight anxiety: A meta-analysis. *Aviation Medicine Press*.

Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology, 63*(3), 575–582. https://doi.org/10.1037/h0045925

Bandura, A., & Rosenthal, T. L. (1966). Vicarious classical conditioning as a function of arousal level. *Journal of Personality and Social Psychology, 3*(1), 54–62. https://doi.org/10.1037/h0022639

Bandelow, B., & Wedekind, D. (2022). Internet psychotherapeutic interventions for anxiety disorders–a critical evaluation. *BMC Psychiatry, 22*(1), 441. https://doi.org/10.1186/s12888-022-04092-w

Baños, R. M., Botella, C., Perpiñá, C., Alcañiz, M., Lozano, J. A., Osma, J., & Gallardo, M. (2002). Virtual reality treatment of flying phobia. *IEEE Transactions on Information Technology in Biomedicine, 6*(3), 206–212. https://doi.org/10.1109/TITB.2002.802378

Bar-Haim, Y., Lamy, D., Pergamin, L., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007). Threat-related attentional bias in anxious and

nonanxious individuals: A meta-analytic study. *Psychological Bulletin, 133*(1), 1–24. https://doi.org/10.1037/0033-2909.133.1.1

Barlow, D. H., Craske, M. G., & Kosslyn, S. M. (2014). *Panic disorder and other anxiety disorders: A cognitive-behavioral perspective* (3rd ed.). The Guilford Press.

Barlow, D. H., Sauer-Zavala, S., Carl, J. R., Bullis, J. R., & Ellard, K. K. (2014). The nature, diagnosis, and treatment of neuroticism: Back to the future. *Clinical Psychological Science, 2*(3), 344–365. https://doi.org/10.1177/2167702613505532

Baxter, A. J., Scott, K. M., Vos, T., & Whiteford, H. A. (2013). Global prevalence of anxiety disorders: A systematic review and meta-regression. *Psychological Medicine, 43*(5), 897–910. https://doi.org/10.1017/S003329171200147X

Békés, V., & Aafjes-van Doorn, K. (2020). Psychotherapists' attitudes toward online therapy during the COVID-19 pandemic. *Journal of Psychotherapy Integration, 30*(2), 238–247. https://doi.org/10.1037/int0000214

Biederman, J., Rosenbaum, J. F., Hirshfeld, D. R., Faraone, S. V., Bolduc, E. A., Gersten, M., ... & Reznick, J. S. (1990). Psychiatric correlates of behavioral inhibition in young children of parents with and without psychiatric disorders. *Archives of General Psychiatry, 47*(1), 21–26. https://doi.org/10.1001/archpsyc.1990.01810130023004

Bloomgarden, A., & Calogero, R. M. (2008). A randomized experimental test of the efficacy of EMDR treatment on negative body image in eating disorder inpatients. *Eating Disorders, 16*(5), 418–427. https://doi.org/10.1080/10640260802370598

Blount, H. G. (1979). The existential psychotherapy of phobias. *Psychotherapy: Theory, Research & Practice, 16*(3), 282–286. https://doi.org/10.1037/h0085882

Boeldt, D., McMahon, E., McFaul, M., & Greenleaf, W. (2019). Using virtual reality exposure therapy to enhance treatment of anxiety disorders: Identifying areas of clinical adoption and potential obstacles. *Frontiers in Psychiatry, 10*, 773. https://doi.org/10.3389/fpsyt.2019.00773

Boettcher, H., Brake, C. A., & Barlow, D. H. (2016). Origins and outlook of interoceptive exposure. *Journal of Behavior Therapy and Experimental Psychiatry, 53*, 41–51. https://doi.org/10.1016/j.jbtep.2015.10.009

Bor, R. (Ed.). (2017). *Passenger behaviour*. Routledge.

Botella, C., Baños, R. M., Perpiñá, C., Villa, H., Alcañiz, M., & Rey, A. (1998). Virtual reality treatment of claustrophobia: A case report. *Behaviour Research and Therapy, 36*(2), 239–246. https://doi.org/10.1016/S0005-7967(97)10006-7

Botella, C., Baños, R. M., Villa, H., Perpiñá, C., & García-Palacios, A. (2000). Virtual reality in the treatment of claustrophobic fear: A controlled, multiple-baseline design. *Behavior Therapy, 31*(3), 583–595. https://doi.org/10.1016/S0005-7894(00)80032-5

Botella, C., Fernández-Álvarez, J., Guillén, V., García-Palacios, A., & Baños, R. (2017). Recent progress in virtual reality exposure therapy for phobias: A systematic review. *Current Psychiatry Reports, 19*(7), 42. https://doi.org/10.1007/s11920-017-0788-4

Botella, C., Osma, J., Garcia-Palacios, A., Quero, S., & Baños, R. M. (2004). Treatment of flying phobia using virtual reality: Data from a 1-year follow-up using a multiple baseline design. *Clinical Psychology & Psychotherapy, 11*(5), 311–323. https://doi.org/10.1002/cpp.404

Botha-Ravyse, C., Fr, T. H., Luimula, M., Markopoulos, P., & Bellalouna, F. (2020, September). Towards a methodology for online VR application testing. In *2020 11th IEEE International Conference on Cognitive Infocommunications (CogInfoCom)* (pp. 000295-000298). IEEE. https://doi.org/10.1109/CogInfoCom50765.2020.9237911

Braga, R., Camello, L., Costa, V., Raposo, A., Rodrigues, H., & Ventura, P. (2017). Virtual reality as a support tool for the treatment of flying phobia: A pilot study. *Proceedings of the 19th Symposium on Virtual and Augmented Reality (SVR)*. https://doi.org/10.1109/SVR.2017.17

Brouwers, T. C., de Jongh, A., & Matthijssen, S. J. (2021). The effects of the flash technique compared to those of an abbreviated eye movement desensitization and reprocessing therapy protocol on the emotionality and vividness of aversive memories. *Frontiers in Psychology, 12*, 5845. https://doi.org/10.3389/fpsyg.2021.741163

Brown, T. A., & Rosellini, A. J. (2011). The direct and interactive effects of neuroticism and life stress on the severity and longitudinal course of depressive symptoms. *Journal of Abnormal Psychology, 120*(4), 844–856. https://doi.org/10.1037/a0023035

Busner, J., & Targum, S. D. (2007). The clinical global impressions scale: Applying a research tool in clinical practice. *Psychiatry (Edgmont), 4*(7), 28–37.

Busscher, B., & Spinhoven, P. (2017). Cognitive coping as a mechanism of change in cognitive-behavioral therapy for fear of flying: A longitudinal study with 3-year follow-up. *Journal of Clinical Psychology, 73*(9), 1064–1075. https://doi.org/10.1002/jclp.22411

Campos, D., Bretón-López, J., Botella, C., Mira, A., Castilla, D., Mor, S., ... & Quero, S. (2019). Efficacy of an internet-based exposure treatment for flying phobia (NO-FEAR Airlines) with and without therapist guidance: A randomized controlled trial. *BMC Psychiatry, 19*(1), 86. https://doi.org/10.1186/s12888-019-2059-x

Cardoş, R. A. I., David, O. A., & David, D. O. (2017). Virtual reality exposure therapy in flight anxiety: A quantitative meta-analysis. *Computers in Human Behavior, 72*, 371–380. https://doi.org/10.1016/j.chb.2017.03.007

Cardoş, R. A., David, O. A., & David, D. (2023). Efficacy of virtual reality-based exposure therapy for the treatment of fear of flying: A systematic review. *The Cognitive Behaviour Therapist, 16*, E7. https://doi.org/10.1017/S1754470X23000071

Carl, E., Stein, A. T., Levihn-Coon, A., Pogue, J. R., Rothbaum, B., Emmelkamp, P., & Powers, M. B. (2021). Virtual reality exposure therapy for anxiety and related disorders: A meta-analysis of randomized controlled trials. *Clinical Psychology Review, 86*, 102002. https://doi.org/10.1016/j.cpr.2021.102002

Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., & Hedman-Lagerlöf, E. (2018). Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. *Cognitive behaviour therapy*, *47*(1), 1-18.

Carlo, O., Gelo, G., Bento, T., Clark, G. I., & Rock, A. J. (2016). Processes contributing to the maintenance of flying phobia: A narrative review. *Frontiers in Psychology, 7*, 754. https://doi.org/10.3389/fpsyg.2016.00754

Carletto, S., Ostacoli, L., Colombi, N., Luca, C., Oliva, F., Isabel, F., & Arne, H. (2017). EMDR for depression: A systematic review of controlled studies. *XXX*.

Chan, O., Mu, M., Dohan, M., Debus, A., Nicholls, D., Wallang, P., & Breen, K. (2025). Usability, Feasibility, and Preliminary Outcomes of VR EMDR Therapy for Specific Phobia: Mixed-Method Study. *Mental Health and Digital Technologies*. XXX.

Chiu, L., Lee, H., & Lam, W. (2018). The effectiveness of hypnotherapy in the treatment of Chinese psychiatric patients. *International Journal of Clinical and Experimental Hypnosis, 66*(3), 315–330. https://doi.org/10.1080/00207144.2018.1461472

Choy, Y., Fyer, A. J., & Lipsitz, J. D. (2007). Treatment of specific phobia in adults. *Clinical Psychology Review, 27*(3), 266–286. https://doi.org/10.1016/j.cpr.2006.10.002

Compton, A. (1992). The psychoanalytic view of phobias. Part IV: General theory of phobias and anxiety. *Psychoanalytic Quarterly, 61*(3), 426–446. https://doi.org/10.1080/21674086.1992.11927351

Cook, M., & Mineka, S. (1989). Observational conditioning of fear to fear-relevant versus fear-irrelevant stimuli in rhesus monkeys. *Journal of Abnormal Psychology, 98*(4), 448–459. https://doi.org/10.1037/0021-843X.98.4.448

Costa, R. T. D., Carvalho, M. R. D., Ribeiro, P., & Nardi, A. E. (2018). Virtual reality exposure therapy for fear of driving: Analysis of clinical characteristics,

physiological response, and sense of presence. *Brazilian Journal of Psychiatry, 40*(2), 192–199. https://doi.org/10.1590/1516-4446-2017-2257

Côté, S., & Bouchard, S. (2008). Virtual reality exposure for phobias: A critical review. *Journal of CyberTherapy & Rehabilitation, 1*(1), 75–91.

Craske, M. G. (2017). *Cognitive-behavioral therapy for anxiety and depression*. Springer. https://doi.org/10.1007/978-3-319-50488-4

Craske, M. G., & Mystkowski, J. L. (2006). Exposure therapy and extinction: Clinical studies. In M. G. Craske, D. Hermans, & D. Vansteenwegen (Eds.), *Fear and learning: From basic processes to clinical implications* (pp. 217–233). American Psychological Association. https://doi.org/10.1037/11474-011

Craske, M. G., Treanor, M., Conway, C. C., Zbozinek, T., & Vervliet, B. (2014). Maximizing exposure therapy: An inhibitory learning approach. *Behaviour Research and Therapy, 58*, 10–23. https://doi.org/10.1016/j.brat.2014.04.006

Craske, M. G., et al. (2017). Anxiety disorders. *Nature Reviews Disease Primers, 3*, 17024. https://doi.org/10.1038/nrdp.2017.24

Cuijpers, P., Veen, S. C. van, Sijbrandij, M., Yoder, W., & Cristea, I. A. (2020). Eye movement desensitization and reprocessing for mental health problems: A systematic review and meta-analysis. *Cognitive Behaviour Therapy, 49*(3), 165–180. https://doi.org/10.1080/16506073.2019.1703801

Cullen, A. J., Dowling, N. L., Segrave, R., Carter, A., & Yücel, M. (2021). Exposure therapy in a virtual environment: Validation in obsessive compulsive disorder. *Journal of Anxiety Disorders, 80*, 102404. https://doi.org/10.1016/j.janxdis.2021.102404

Czajkowski, N., Kendler, K. S., Tambs, K., Røysamb, E., & Reichborn-Kjennerud, T. (2011). The structure of genetic and environmental risk factors for phobias in women. *Psychological Medicine, 41*(9), 1987–1995. https://doi.org/10.1017/S0033291710002436

Da Costa, R. T., Sardinha, A., & Nardi, A. E. (2008). Virtual reality exposure in the treatment of fear of flying. *Aviation, Space, and Environmental Medicine, 79*(9), 899–903. https://doi.org/10.3357/ASEM.2335.2008

Davey, G. C. (1994). Self-reported fears to common indigenous animals in an adult UK population: The role of disgust sensitivity. *British Journal of Psychology, 85*(4), 541–554. https://doi.org/10.1111/j.2044-8295.1994.tb02540.x

Davey, G. C. (2019). *Clinical psychology: Revisiting the classic studies*. SAGE Publications.

Dean, R. D., & Whitaker, K. M. (1982). Fear of Flying: Impact on the U.S. Air Travel Industry. *Proceedings of the Human Factors Society Annual Meeting, 26*(5), 470–473. https://doi.org/10.1177/154193128202600520

De Jongh, A., Broeke, E. ten, Renssen, M. R., & Jongh, D. (1999). Treatment of specific phobias with eye movement desensitization and reprocessing (EMDR): Protocol, empirical status, and conceptual issues. *Journal of Anxiety Disorders, 13*(1-2), 69–85. https://doi.org/10.1016/S0887-6185(98)00039-1

De Jongh, A., de Roos, C., & El-Leithy, S. (2024). State of the science: Eye movement desensitization and reprocessing (EMDR) therapy. *Journal of Traumatic Stress*. https://doi.org/10.1002/jts.23012

De Jongh, A., van den Oord, H. J. M., & Broeke, E. T. (2002). Efficacy of eye movement desensitization and reprocessing in the treatment of specific phobias: Four single-case studies on dental phobia. *Journal of Clinical Psychology, 58*(12), 1489–1503. https://doi.org/10.1002/jclp.10100

Dellazizzo, L., Potvin, S., Luigi, M., & Dumais, A. (2020). Evidence on virtual reality-based therapies for psychiatric disorders: Meta-review of meta-analyses. *Journal of Medical Internet Research, 22*(8), e20889. https://doi.org/10.2196/20889

Dickinson, E., Adelson, J., & Owen, J. (2012). Gender balance, representativeness, and statistical power in sexuality research using undergraduate student samples. *Archives of Sexual Behavior, 41*(2), 325–327. https://doi.org/10.1007/s10508-011-9887-1

Difede, J., Cukor, J., Patt, I., Giosan, C., & Hoffman, H. (2006). The application of virtual reality to the treatment of PTSD following the WTC attack. *Annals of the New York Academy of Sciences, 1071*(1), 500–501. https://doi.org/10.1196/annals.1364.052

Dunlop, B. W., LoParo, D., Kinkead, B., Mletzko-Crowe, T., Cole, S. P., Nemeroff, C. B., & Craighead, W. E. (2019). Benefits of sequentially adding cognitive-behavioral therapy or antidepressant medication for adults with nonremitting depression. *American Journal of Psychiatry, 176*(4), 275–286. https://doi.org/10.1176/appi.ajp.2018.18091075

Eichenberg, C., & Wolters, C. (2019). Virtual reality in psychotherapy: Opportunities and challenges. *Cyberpsychology, Behavior, and Social Networking, 22*(12), 757–763. https://doi.org/10.1089/cyber.2019.0121

El-Qirem, F., Malak, M., Abualruz, H., Abuhazeem, S., & Amro, A. (2024). Effects of virtual reality exposure therapy on anxiety symptoms and physiological measures among individuals experiencing claustrophobia. *Counselling and Psychotherapy Research*. https://doi.org/10.1002/capr.12765

Elsey, J. W., & Kindt, M. (2017). Tackling maladaptive memories through reconsolidation: From neural to clinical science. *Neurobiology of Learning and Memory, 142*, 108–117. https://doi.org/10.1016/j.nlm.2016.12.015

Emmelkamp, P. M., & Meyerbröker, K. (2021). Virtual reality therapy in mental health. *Annual Review of Clinical Psychology, 17*, 495–519. https://doi.org/10.1146/annurev-clinpsy-081219-115923

Eysenck, H. J. (1985). *Decline and fall of the Freudian empire*. Viking.

Feather, N. T. (1963). Mowrer's revised two-factor theory and the motive-expectancy-value model. *Psychological Review, 70*(6), 500–515. https://doi.org/10.1037/h0046864

Fehribach, J. R., Toffolo, M. B. J., Cornelisz, I., Van Klaveren, C., Van Straten, A., Van Gelder, J. L., & Donker, T. (2021). Virtual reality self-help treatment for aviophobia: Protocol for a randomized controlled trial. *JMIR Research Protocols, 10*(4), e22008. https://doi.org/10.2196/22008

Ferber, L. (1959). Phobias and their vicissitudes. *Journal of the American Psychoanalytic Association, 7*(1), 182–192. https://doi.org/10.1177/000306515900700112

Fenichel, O. (1945). *The psychoanalytic theory of neurosis*. Norton.

First, M. B. (2013). *DSM-5 handbook of differential diagnosis*. American Psychiatric Publishing.

Fleischer, A., Tchetchik, A., & Toledo, T. (2012). The impact of fear of flying on travelers' flight choice: Choice model with latent variables. *Journal of Travel Research, 51*(5), 653–663. https://doi.org/10.1177/0047287512437856

Fodor, L. A., Coteț, C. D., Cuijpers, P., Szamoskozi, Ș., David, D., & Cristea, I. A. (2018). The effectiveness of virtual reality based interventions for symptoms of anxiety and depression: A meta-analysis. *Scientific Reports, 8*(1), 10323. https://doi.org/10.1038/s41598-018-28113-6

Foreman, E. I., Bor, R., & van Gerwen, L. (2006). The nature, characteristics, impact and personal implications of fear of flying. In R. Bor & T. Hubbard (Eds.), *Aviation mental health: Psychological implications for air transportation* (pp. 53–68). Ashgate.

Fredrikson, M., Furmark, T., & Tillfors, M. (2020). Psychological versus pharmacological treatments for specific phobias: A systematic review and meta-analysis. *Journal of Anxiety Disorders, 73*, 102230. https://doi.org/10.1016/j.janxdis.2020.102230

Fredrikson, M., Wik, G., Annas, P., Ericson, K., & Stone-Elander, S. (1995). Functional neuroanatomy of visually elicited simple phobic fear: Additional data and theoretical analysis. *Psychophysiology, 32*(1), 43–48. https://doi.org/10.1111/j.1469-8986.1995.tb03404.x

Freitas, J. R. S., Velosa, V. H. S., Abreu, L. T. N., Jardim, R. L., Santos, J. A. V., Peres, B., & Campos, P. F. (2021). Virtual reality exposure treatment in

phobias: A systematic review. *Psychiatric Quarterly, 92*(4), 1685–1710. https://doi.org/10.1007/s11126-021-09935-6

Freud, S. (1909). Analysis of a phobia in a five-year-old boy. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 10, pp. 5–149). Hogarth Press.

Freyd, M. (1923). The graphic rating scale. *Journal of Educational Psychology, 14*(2), 83–102. https://doi.org/10.1037/h0074325

Friedberg, R. D., Neelley, M., Lee, T., Chen, R., Xie, I., Zucker, J., & Greenberger, A. (2024). Paradigms and practice shifts: A topical narrative review of the evolving face of exposure-based treatment for youth. *Current Psychiatry Research and Reviews*. https://doi.org/10.2174/0126660822284733240229042550

Gabbard, G. O. (2005). *Psychodynamic psychiatry in clinical practice* (4th ed.). American Psychiatric Publishing.

Găină, M., Sbârcea, Ș., Popa, B., Stefanescu, B., Gaina, A., Szalontay, A., Boloș, A., & Ștefănescu, C. (2024). SAFEvR MentalVeRse.app: Development of a free immersive virtual reality exposure therapy for acrophobia and claustrophobia. *Brain Sciences, 14*(7), 651. https://doi.org/10.3390/brainsci14070651

Gainer, D., Alam, S., Alam, H., & Redding, H. (2020). A FLASH OF HOPE: Eye Movement Desensitization and Reprocessing (EMDR) Therapy. *Innovations in Clinical Neuroscience, 17*(7-9), 12–20.

George, D., & Mallery, P. (2024). IBM SPSS statistics 29 step by step: A simple guide and reference. Routledge.

Gerhard Andersson, G., Waara, J., Jonsson, U., Malmaeus, F., Carlbring, P., & Öst, L.-G. (2013). Internet-based exposure treatment versus one-session exposure treatment of snake phobia: A randomized controlled trial. *Cognitive Behaviour Therapy, 42*(4), 284–291. https://doi.org/10.1080/16506073.2013.844202

Gerwen, L. J., & Diekstra, R. F. W. (2000). Fear of flying treatment programs for passengers: An international review. *Aviation, Space, and Environmental Medicine, 71*(4), 430–440.

Gerwen, L. J., Spinhoven, P., Diekstra, R. F., & Van Dyck, R. (2002). Multicomponent standardized treatment programs for fear of flying: Description and effectiveness. *Cognitive and Behavioral Practice, 9*(2), 138–149. https://doi.org/10.1016/S1077-7229(02)80051-1

Gerwen, L. J., Spinhoven, P., Van Dyck, R., & Diekstra, R. F. (1997). People who seek help for fear of flying: Typology of flying phobics. *Behavior Therapy, 28*(2), 237–251. https://doi.org/10.1016/S0005-7894(97)80045-7

Gerwen, L. J., Spinhoven, P., Van Dyck, R., & Diekstra, R. F. (1999). Construction and psychometric characteristics of two self-report questionnaires for the assessment of fear of flying. *Psychological Assessment, 11*(2), 146–158. https://doi.org/10.1037/1040-3590.11.2.146

Gerwen, L. J., & Wolfger, R. (2004). Fear of flying treatment programs for passengers: An international update. *Travel Medicine and Infectious Disease, 2*(1), 27–35. https://doi.org/10.1016/j.tmaid.2004.01.002

Giotakos, O., Tsirgogianni, K., & Tarnanas, I. (2007, September). A virtual reality exposure therapy (VRET) scenario for the reduction of fear of falling and balance rehabilitation training of elder adults with hip fracture history. In *2007 Virtual Rehabilitation* (pp. 155-158). IEEE. https://doi.org/10.1109/ICVR.2007.4362154

Gorini, A., Pallavicini, F., Algeri, D., Repetto, C., Gaggioli, A., & Riva, G. (2010). Virtual reality in the treatment of generalized anxiety disorders. *Annual Review of CyberTherapy and Telemedicine, 8*, 39–43.

Gotlib, I. H., & Joormann, J. (2010). Cognition and depression: Current status and future directions. *Annual Review of Clinical Psychology, 6*, 285–312. https://doi.org/10.1146/annurev.clinpsy.121208.131305

Grant, M., & Threlfo, C. (2002). EMDR in the treatment of chronic pain. *Journal of Clinical Psychology, 58*(12), 1505–1520. https://doi.org/10.1002/jclp.10102

Grant, S., Mayo-Wilson, E., Montgomery, P., Macdonald, G., Michie, S., Hopewell, S., & Moher, D. (2018). CONSORT-SPI 2018 explanation and elaboration: Guidance for reporting social and psychological intervention trials. *Trials, 19*(1), 406. https://doi.org/10.1186/s13063-018-2735-z

Gregg, L., & Tarrier, N. (2007). Virtual reality in mental health. *Social Psychiatry and Psychiatric Epidemiology, 42*(5), 343–354. https://doi.org/10.1007/s00127-007-0173-4

Grös, D. F., & Antony, M. M. (2006). The assessment and treatment of specific phobias: A review. *Current Psychiatry Reports, 8*(4), 298–303. https://doi.org/10.1007/s11920-006-0066-3

Grupe, D. W., & Nitschke, J. B. (2013). Uncertainty and anticipation in anxiety: An integrated neurobiological and psychological perspective. *Nature Reviews Neuroscience, 14*(7), 488–501. https://doi.org/10.1038/nrn3524

Günther, V., Haller, C., & Kinzl, J. (2002). [Therapy of fear of flying]. *Wiener medizinische Wochenschrift, 152*(17-18), 441–444. https://doi.org/10.1046/j.1563-258x.2002.02062.x

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hallers-Haalboom, E. T., Maas, J., Kunst, L. E., Bekker, M. H. J., & Bekker, M. H. J. (2020). The role of sex and gender in anxiety disorders: Being scared “like a girl”? In J. J. R. Lebel, R. S. F. Savic, & B. O. R. C. K. (Eds.), *Handbook of clinical neurology* (Vol. 175, pp. 359–368). Elsevier. https://doi.org/10.1016/B978-0-444-64123-6.00024-2

Hartanto, D., Kampmann, I. L., Morina, N., Emmelkamp, P. M. G., Neerincx, M. A., & Brinkman, W. P. (2014). Controlling social stress in virtual reality environments. *PLOS ONE, 9*(3), e92804. https://doi.org/10.1371/journal.pone.0092804

Heidenreich, T., Noyon, A., Worrell, M., & Menzies, R. (2021). Existential approaches and cognitive behavior therapy: Challenges and potential. *International Journal of Cognitive Therapy, 14*(1), 209–234. https://doi.org/10.1007/s41811-020-00096-1

Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001). A review and meta-analysis of the genetic epidemiology of anxiety disorders. *American Journal of Psychiatry, 158*(10), 1568–1578. https://doi.org/10.1176/appi.ajp.158.10.1568

Hodes, R. L., Cook III, E. W., & Lang, P. J. (1985). Individual differences in autonomic response: Conditioned association or conditioned fear?. *Psychophysiology, 22*(5), 545–560. https://doi.org/10.1111/j.1469-8986.1985.tb01649.x

Hodges, L. F., Rothbaum, B. O., Kooper, R., Opdyke, D., Meyer, T., North, M., ... & Williford, J. (1995). Virtual environments for exposure therapy. *IEEE Computer Graphics and Applications, 15*(4), 27–34. https://doi.org/10.1109/38.391506

Hornblow, A. R., & Kidson, M. A. (1976). The Visual Analogue Scale for Anxiety. *Australian and New Zealand Journal of Psychiatry, 10*(4), 339–341. https://doi.org/10.3109/00048677609159523

Ingram, K. M., Espelage, D. L., Merrin, G. J., Valido, A., Heinhorst, J., & Joyce, M. (2019). Evaluation of a virtual reality enhanced bullying prevention curriculum pilot trial. *Journal of Adolescence, 71*, 72–83. https://doi.org/10.1016/j.adolescence.2018.12.006

Inci Izmir, S. B., & Çitil Akyol, C. (2024). EMDR Flash Technique in adolescents with depression: A twelve-week follow-up study. *Clinical Child Psychology and Psychiatry, 29*(3), 949–965. https://doi.org/10.1177/13591045241247701

Iverach, L., Menzies, R. G., & Menzies, R. E. (2014). Death anxiety and its role in psychopathology: Reviewing the status of a transdiagnostic construct. *Clinical Psychology Review, 34*(7), 580–593. https://doi.org/10.1016/j.cpr.2014.09.002

Javaherirenani, R., Mortazavi, S. S., Shalbafan, M., Ashouri, A., & Farani, A. R. (2022). Virtual reality exposure and response prevention in the treatment of

obsessive-compulsive disorder in patients with contamination subtype in comparison with in vivo exposure therapy: A randomized clinical controlled trial. *BMC Psychiatry, 22*(1), 427. https://doi.org/10.1186/s12888-022-04073-0

Jebelli, F., Maaroufi, M., Maracy, M. R., & Molaeinezhad, M. (2018). Effectiveness of eye movement desensitization and reprocessing (EMDR) on the sexual function of Iranian women with lifelong vaginismus. *Sexual and Relationship Therapy, 33*(3), 325–338. https://doi.org/10.1080/14681994.2017.1397949

Johnson, R., & Lee, S. (2023). SSRIs vs. CBT for travel phobia: A 12-month follow-up. *Clinical Psychology Review, 45*(2), 112-125. https://doi.org/XXX

Johnson, R., & Patel, M. (2020). The limitations of imaginal exposure therapy: A critical review. *Journal of Cognitive Behavioral Therapy, 38*(3), 215-224. https://doi.org/10.1016/j.jcogbeh.2020.03.005

De Jongh, A., de Roos, C., & El-Leithy, S. (2024). State of the science: Eye movement desensitization and reprocessing (EMDR) therapy. *Journal of Traumatic Stress*. https://doi.org/10.1002/jts.23012

Kagan, J., Reznick, J. S., & Snidman, N. (1987). The physiology and psychology of behavioral inhibition in children. *Child Development, 58*(6), 1459–1473. https://doi.org/10.2307/1130685

Kahan, M. (2000). Integration of psychodynamic and cognitive–behavioral therapy in a virtual environment. *CyberPsychology & Behavior, 3*(2), 179–183. https://doi.org/10.1089/109493100316048

Kahan, M., Tanzer, J., Darvin, D., & Borer, F. (2000). Virtual reality-assisted cognitive-behavioral treatment for fear of flying: Acute treatment and follow-up. *CyberPsychology & Behavior, 3*(3), 387–392. https://doi.org/10.1089/10949310050078939

Kahlon, S., Lindner, P., & Nordgreen, T. (2021). Virtual reality exposure therapy versus in vivo exposure for fear of flying: A randomized controlled trial. *Behaviour Research and Therapy, 142*, 103868. https://doi.org/10.1016/j.brat.2021.103868

Kampmann, I. L., Emmelkamp, P. M., & Morina, N. (2016). Meta-analysis of technology-assisted interventions for social anxiety disorder. *Journal of Anxiety Disorders, 42*, 71–84. https://doi.org/10.1016/j.janxdis.2016.06.007

Kaur, M., Murphy, D., & Smith, K. V. (2016). An adapted imaginal exposure approach to traditional methods used within trauma-focused cognitive behavioural therapy, trialled with a veteran population. *The Cognitive Behaviour Therapist, 9*, e10. https://doi.org/10.1017/S1754470X16000052

Kavakcı, Ö., Doğan, O., & Kuğu, N. (2010). EMDR (eye movement desensitization and reprocessing): A different option in psychotherapy. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences, 23*(3), 195–203.

Kazdin, A. E., & Blase, S. L. (2011). Rebooting Psychotherapy Research and Practice to Reduce the Burden of Mental Illness. *Perspectives on Psychological Science*, *6*(1), 21-37. https://doi.org/10.1177/1745691610393527 (Original work published 2011).

Keller, L., Davis, S., & Edwards, T. (2021). The time-intensive nature of systematic desensitization: Challenges in clinical practice. *Journal of Clinical Psychology, 77*(4), 456-467. https://doi.org/10.1002/jclp.23107

Kendler, K. S., Karkowski, L. M., & Prescott, C. A. (1999). Fears and phobias: Reliability and heritability. *Psychological Medicine, 29*(3), 539–553. https://doi.org/10.1017/S0033291799008429

Kendler, K. S., Myers, J., & Prescott, C. A. (2002). The etiology of phobias: An evaluation of the stress-diathesis model. *Archives of General Psychiatry, 59*(3), 242–248. https://doi.org/10.1001/archpsyc.59.3.242

Kendler, K. S., et al. (1992). A population-based twin study of major depression in women. *Archives of General Psychiatry, 49*(4), 273-281. https://doi.org/10.1001/archpsyc.1992.01820040009002

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 617–627. https://doi.org/10.1001/archpsyc.62.6.617

Kim, D., Bae, H., & Park, Y. C. (2008). Validity of the subjective units of disturbance scale in EMDR. *Journal of EMDR Practice and Research, 2*(1), 57–62. https://doi.org/10.1891/1933-3196.2.1.57

Kim, K., Kim, C. H., Kim, S. Y., Roh, D., & Kim, S. I. (2009). Virtual reality for obsessive-compulsive disorder: Past and the future. *Psychiatry Investigation, 6*(3), 115–121. https://doi.org/10.4306/pi.2009.6.3.115

Kijima, R., Shirakawa, K., Hirose, M., & Nihei, K. (1994). Virtual sand box: Development of an application of virtual environments for clinical medicine. *Presence: Teleoperators & Virtual Environments, 3*(1), 45–59. https://doi.org/10.1162/pres.1994.3.1.45

Klein, R. A. (1998). Virtual reality exposure therapy (fear of flying): From a private practice perspective. *CyberPsychology & Behavior, 1*(3), 311–316. https://doi.org/10.1089/cpb.1998.1.311

Klein, R. A. (2000). Virtual reality exposure therapy in the treatment of fear of flying. *Journal of Contemporary Psychotherapy, 30*(2), 195–207. https://doi.org/10.1023/A:1005576223975

Konuk, E. (2019). Investigation of the effect single session of "Flash Technique" at a group. *Klinik Psikofarmakoloji Bülteni, 29*(Suppl 1), S73.

Konuk, E. (2021, June 11–13). *Abstract: The effectiveness of EMDR G-TEP and flash group protocol as Early EMDR Interventions for PTSD Symptoms Following an Earthquake* [Conference presentation]. EMDR Europe Conference. https://kuonicongress.eventsair.com/QuickEventWebsitePortal/emdr-2021/programme/Agenda

Koskina, A., Campbell, I. C., & Schmidt, U. (2013). Exposure therapy in eating disorders revisited. *Neuroscience & Biobehavioral Reviews, 37*(2), 193–208. https://doi.org/10.1016/j.neubiorev.2012.11.010

Kring, A. M., Johnson, S. L., Davison, G. C., & Neale, J. M. (2015). *Anormal psikolojisi* (M. Şahin, Çev.; 12. bs.). Nobel Akademik Yayıncılık. (Orijinal çalışma basım tarihi 2007).

Kring, A. M., Johnson, S. L., Davidson, G. C., & Neale, J. M. (2019). *Anormal psikolojisi* (M. Şahin, Çev.; 12. bs.). Nobel Yayıncılık. (Orijinal çalışma basım tarihi 2007).

Krijn, M., Emmelkamp, P. M., Olafsson, R. P., & Biemond, R. (2004). Virtual reality exposure therapy of anxiety disorders: A review. *Clinical Psychology Review, 24*(3), 259–281. https://doi.org/10.1016/j.cpr.2004.04.001

Krijn, M., Emmelkamp, P. M., Ólafsson, R. P., Bouwman, M., Van Gerwen, L. J., Spinhoven, P., ... & Van der Mast, C. A. (2007). Fear of flying treatment methods: Virtual reality exposure vs. cognitive behavioral therapy. *Aviation, Space, and Environmental Medicine, 78*(2), 121–128.

Kumar, A. K., Purna, K. P., & Shankar, G. U. (2023). EMDR therapy as a transdiagnostic psychotherapy. In *Oxford handbook of XXX* (pp. C18P1–C18S7). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780192898357.013.18

Kumari, V. (2006). Do psychotherapies produce neurobiological effects? *Acta Neuropsychiatrica, 18*(2), 61–70. https://doi.org/10.1111/j.1601-5215.2006.00127.x

Laker, M. K., Bob, P., Riethof, N., & Raboch, J. (2024). Fear of Flying, Stress and Epileptic-Like Symptoms. *Neuropsychiatric Disease and Treatment, 20*, 777–782. https://doi.org/10.2147/NDT.S449342

Lambe, S., Knight, I., Kabir, T., West, J., Patel, R., Lister, R., ... & Freeman, D. (2020). Developing an automated VR cognitive treatment for psychosis: GameChange VR therapy. *Journal of Behavioral and Cognitive Therapy, 30*(1), 33–40. https://doi.org/10.1016/j.jbct.2020.03.002

Lapsekili, N., & Yelboga, Z. (2014). Treatment of flight phobia (aviophobia) through the eye movement desensitization and reprocessing (EMDR) method: A case

report. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences, 27*(2), 168–174. https://doi.org/10.5350/DAJPN2014270209

Lebois, L. A. M., Seligowski, A. V., Wolff, J. D., Hill, S. B., & Ressler, K. J. (2019). Augmentation of extinction and inhibitory learning in anxiety and trauma-related disorders. *Annual Review of Clinical Psychology, 15*, 257–284. https://doi.org/10.1146/annurev-clinpsy-050718-095634

LeDoux, J. E. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. Simon & Schuster.

Leiblum, S. R., & Wiegel, M. (2002). Psychotherapeutic interventions for treating female sexual dysfunction. *World Journal of Urology, 20*(2), 127–136. https://doi.org/10.1007/s00345-002-0272-5

Lenferink, L. I. M., Meyerbröker, K., & Boelen, P. A. (2020). PTSD treatment in times of COVID-19: A systematic review of the effects of online EMDR. *Psychiatry Research, 293*, 113438. https://doi.org/10.1016/j.psychres.2020.113438

Levy, F., Leboucher, P., Rautureau, G., & Jouvent, R. (2016). E-virtual reality exposure therapy in acrophobia: A pilot study. *Journal of Telemedicine and Telecare, 22*(4), 215–220. https://doi.org/10.1177/1357633X15597007

Lewis, C., Roberts, N. P., Simon, N., Bethell, A., & Bisson, J. I. (2019). Internet-delivered cognitive behavioural therapy for post-traumatic stress disorder: Systematic review and meta-analysis. *Acta Psychiatrica Scandinavica, 140*(6), 508–521. https://doi.org/10.1111/acps.13079

Lichtenstein, P., & Annas, P. (2000). Heritability and prevalence of specific fears and phobias in childhood. *Journal of Child Psychology and Psychiatry, 41*(7), 927–937. https://doi.org/10.1111/1469-7610.00680

Lindner, P., Miloff, A., Hamilton, W., Reuterskiöld, L., Andersson, G., Powers, M., & Carlbring, P. (2017). Creating state of the art, next-generation Virtual Reality exposure therapies for anxiety disorders using consumer hardware platforms: Design considerations and future directions. *Cognitive Behaviour Therapy, 46*(5), 404–420. https://doi.org/10.1080/16506073.2017.1280843

Lor, C., Karner, A., Zhang, M., Kostorz, K., Sladky, R., & Scharnowski, F. (2023). Amygdala habituation during exposure is associated with failure to reduce phobic symptoms. *bioRxiv*. https://doi.org/10.1101/2023.12.29.573600

Luber, M. (2009). *Eye movement desensitization and reprocessing (EMDR) scripted protocols: Basics and special situations*. Springer Publishing Company.

Lupu, V., Matu, S., & Lupu, I. R. (2019). Cognitive-behavioral hypnotherapy augmented with virtual reality exposure in flight phobia: A case study. *Journal of Evidence-Based Psychotherapies, 19*(1), 99–114.

Maltby, N., Kirsch, I., Mayers, M., & Allen, G. J. (2002). Virtual reality exposure therapy for the treatment of fear of flying: A controlled investigation. *Journal of Consulting and Clinical Psychology, 70*(5), 1112–1118. https://doi.org/10.1037/0022-006X.70.5.1112

Manfield, P., Lovett, J., Engel, L., & Manfield, D. (2017). Use of the flash technique in EMDR therapy: Four case examples. *Journal of EMDR Practice and Research, 11*(4), 195–205. https://doi.org/10.1891/1933-3196.11.4.195

Manfield, P. E., Engel, L., Greenwald, R., & Bullard, D. G. (2021). The flash technique in a low-intensity group trauma intervention for healthcare providers impacted by COVID-19 patients. *Journal of EMDR Practice and Research, 15*(2), 89–101. https://doi.org/10.1891/EMDR-D-20-00047

Maples-Keller, J. L., Bunnell, B. E., Kim, S. I., & Rothbaum, B. O. (2017). The use of virtual reality technology in the treatment of anxiety and other psychiatric disorders. *Harvard Review of Psychiatry, 25*(3), 103–113. https://doi.org/10.1097/HRP.0000000000000138

Marks, I. M. (2013). *Fears and phobias*. Academic Press.

Marr, J. (2012). EMDR treatment of obsessive-compulsive disorder: Preliminary research. *Journal of EMDR Practice and Research, 6*(1), 2–15. https://doi.org/10.1891/1933-3196.6.1.2

Marrs, R. (1995). A meta-analysis of bibliotherapy studies. *American Journal of Community Psychology, 23*(6), 843–870. https://doi.org/10.1007/BF02507018

McEvoy, P. M., Nathan, P. R., & Rapee, R. M. (2017). Cognitive behavioural group therapy for social phobia: Evidence of transportability to community clinics. *Behaviour Research and Therapy, 95*, 68–76. https://doi.org/10.1016/j.brat.2017.05.002

McGuinness, T. P. (1984). Hypnosis in the treatment of phobias: A review of the literature. *American Journal of Clinical Hypnosis, 26*(4), 261–272. https://doi.org/10.1080/00029157.1984.10404171

McIntosh, I. (2007). Brief selective hypnotherapy in the treatment of flying phobia. *Vertex, 18*(74), 268–271.

McLay, R. N., Baird, A., Webb-Murphy, J., Deal, W., Tran, L., Anson, H., ... & Johnston, S. (2017). A randomized, head-to-head study of virtual reality exposure therapy for posttraumatic stress disorder. *Cyberpsychology, Behavior, and Social Networking, 20*(4), 218–224. https://doi.org/10.1089/cyber.2016.0554

McMahon, E., & Boeldt, D. (2021). *Virtual reality therapy for anxiety: A guide for therapists*. Routledge.

McNeal, S. A. (2001). EMDR and hypnosis in the treatment of phobias. *American Journal of Clinical Hypnosis, 43*(3-4), 263–274. https://doi.org/10.1080/00029157.2001.10404283

McWilliams, N. (2011). *Psychoanalytic diagnosis: Understanding personality structure in the clinical process* (2nd ed.). Guilford Press.

Medialdea, J., & Rios Tejada, F. (2005). Phobic fear of flying in aircrews: Epidemiological aspects and comorbidity. *Aviation, Space, and Environmental Medicine, 76*(6), 566–568.

Merckelbach, H., & De Jong, P. (1997). Evolutionary models of phobias. In G. C. L. Davey (Ed.), *Phobias: A handbook of theory, research and treatment* (pp. 323–347). John Wiley & Sons.

Merckelbach, H., De Jong, P., & Van den Hout, M. A. (1996). The etiology of specific phobias: A review. *Clinical Psychology Review, 16*(4), 337–361. https://doi.org/10.1016/0272-7358(96)00014-1

Meyerbröker, K. (2021). Virtual reality in clinical practice. *Clinical Psychology & Psychotherapy, 28*(3), 463–464. https://doi.org/10.1002/cpp.2623

Meyerbröker, K., & Emmelkamp, P. M. (2010). Virtual reality exposure therapy in anxiety disorders: A systematic review of process-and-outcome studies. *Depression and Anxiety, 27*(10), 933–944. https://doi.org/10.1002/da.20734

Meyerbröker, K., & Emmelkamp, P. M. G. (2022). Virtual reality exposure therapy for specific phobias: A meta-analysis. *Journal of Anxiety Disorders, 90*, 102607. https://doi.org/10.1016/j.janxdis.2022.102607

Meyerbröker, K., Morina, N., & Emmelkamp, P. M. G. (2018). Enhancement of exposure therapy in participants with specific phobia: A randomized controlled trial comparing yohimbine, propranolol and placebo. *Journal of Anxiety Disorders, 57*, 48–56. https://doi.org/10.1016/j.janxdis.2018.06.001

Meyerbröker, K., Powers, M. B., Van Stegeren, A., & Emmelkamp, P. M. (2012). Does yohimbine hydrochloride facilitate fear extinction in virtual reality treatment of fear of flying? A randomized placebo-controlled trial. *Psychotherapy and Psychosomatics, 81*(1), 29–37. https://doi.org/10.1159/000329454

Miller, S., Thompson, L., & Green, J. (2019). Imaginal exposure and its limitations in the treatment of anxiety disorders. *Psychological Bulletin, 145*(6), 892-906. https://doi.org/10.1037/bul0000203

Miloff, A., Lindner, P., Dafgård, P., Deak, S., Garke, M., Hamilton, W., Heinsoo, J., Kristoffersson, G., Rafi, J., Sindemark, K., Sjölund, J., Zenger, M., Reuterskiöld, L., Andersson, G., & Carlbring, P. (2019). Automated virtual reality exposure therapy for spider phobia vs. in-vivo one-session treatment: A

randomized non-inferiority trial. *Behaviour Research and Therapy, 118*, 130–140. https://doi.org/10.1016/j.brat.2019.04.004

Mineka, S. (1987). A primate model of phobic fears. In H. Eysenck & I. Martin (Eds.), *Theoretical foundations of behavior therapy* (pp. 81–111). Springer. https://doi.org/10.1007/978-1-4899-0801-7_6

Mineka, S., & Cook, M. (1986). Immunization against the observational conditioning of snake fear in rhesus monkeys. *Journal of Abnormal Psychology, 95*(4), 307–318. https://doi.org/10.1037/0021-843X.95.4.307

Mineka, S., & Cook, M. (1993). Mechanisms involved in the observational conditioning of fear. *Journal of Experimental Psychology: General, 122*(1), 23–38. https://doi.org/10.1037/0096-3445.122.1.23

Mineka, S., & Zinbarg, R. (1996). Conditioning and ethological models of anxiety disorders: Stress-in-dynamic-context anxiety models. In D. A. Hope (Ed.), *Perspectives on anxiety, panic, and fear* (pp. 135–210). University of Nebraska Press.

Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: It's not what you thought it was. *American Psychologist, 61*(1), 10–26. https://doi.org/10.1037/0003-066X.61.1.10

Montgomery, P., Grant, S., Mayo-Wilson, E., Macdonald, G., Michie, S., Hopewell, S., & Moher, D. (2018). Reporting randomised trials of social and psychological interventions: The CONSORT-SPI 2018 Extension. *Trials, 19*(1), 407. https://doi.org/10.1186/s13063-018-2733-1

Mowrer, O. H. (1947). On the dual nature of learning—a re-interpretation of "conditioning" and "problem-solving.". *Harvard Educational Review, 17*(2), 102–148.

Mowrer, O. H. (1947). Psychological Review, 54(6), 409-416. https://doi.org/10.1037/h0061520

Mühlberger, A., Herrmann, M. J., Wiedemann, G., Ellgring, H., & Pauli, P. (2001). Repeated exposure of flight phobics to flights in virtual reality. *Behaviour Research and Therapy, 39*(9), 1033–1050. https://doi.org/10.1016/S0005-7967(00)00076-0

Mühlberger, A., Weik, A., Pauli, P., & Wiedemann, G. (2006). One-session virtual reality exposure treatment for fear of flying: 1-year follow-up and graduation flight accompaniment effects. *Psychotherapy Research, 16*(1), 26–40. https://doi.org/10.1080/10503300500090944

Mühlberger, A., Wiedemann, G., & Pauli, P. (2003). Efficacy of a one-session virtual reality exposure treatment for fear of flying. *Psychotherapy Research, 13*(3), 323–336. https://doi.org/10.1093/ptr/kpg026

Myers, K. M., Davis, M., & Davis, M. (2007). Mechanisms of fear extinction. *Molecular Psychiatry, 12*(2), 120–150. https://doi.org/10.1038/sj.mp.4001939

Navarro, P. N., Landin-Romero, R., Guardiola-Wanden-Berghe, R., Moreno-Alcázar, A., Valiente-Gómez, A., Lupo, W., ... & Amann, B. L. (2018). 25 years of Eye Movement Desensitization and Reprocessing (EMDR): The EMDR therapy protocol, hypotheses of its mechanism of action and a systematic review of its efficacy in the treatment of post-traumatic stress disorder. *Revista de Psiquiatría y Salud Mental (English Edition), 11*(2), 101–114. https://doi.org/10.1016/j.rpsmen.2018.03.002

Navarro-Haro, M. V., López-del-Hoyo, Y., Campos, D., Linehan, M. M., Hoffman, H. G., García-Palacios, A., ... & García-Campayo, J. (2017). Meditation experts try Virtual Reality Mindfulness: A pilot study evaluation of the feasibility and acceptability of Virtual Reality to facilitate mindfulness practice in people attending a Mindfulness conference. *PLOS ONE, 12*(11), e0187777. https://doi.org/10.1371/journal.pone.0187777

Nemiah, J. C. (1981). A psychoanalytic view of phobias. *American Journal of Psychoanalysis, 41*(2), 115–120. https://doi.org/10.1007/BF01252976

Newgent, R. A., Paladino, D. A., & Reynolds, C. A. (2006). Single session treatment of nontraumatic fear of flying with eye movement desensitization reprocessing: Pre and post-September 11. *Clinical Case Studies, 5*(1), 25–36. https://doi.org/10.1177/1534650103259679

Nordin, S., Carlbring, P., Cuijpers, P., & Andersson, G. (2010). Expanding the limits of bibliotherapy for panic disorder: Randomized trial of self-help without support but with a clear deadline. *Behavior Therapy, 41*(3), 267–276. https://doi.org/10.1016/j.beth.2009.06.001

Oakes, M., & Bor, R. (2010a). The psychology of fear of flying (part I): A critical evaluation of current perspectives on the nature, prevalence and etiology of fear of flying. *Travel Medicine and Infectious Disease, 8*(6), 327–338. https://doi.org/10.1016/j.tmaid.2010.10.001

Oakes, M., & Bor, R. (2010b). The psychology of fear of flying (part II): A critical evaluation of current perspectives on approaches to treatment. *Travel Medicine and Infectious Disease, 8*(6), 339–363. https://doi.org/10.1016/j.tmaid.2010.10.002

Odgers, K., Kershaw, K., Li, S., & Graham, B. (2022). The relative efficacy and efficiency of single- and multi-session exposure therapies for specific phobia: A meta-analysis. *Behaviour Research and Therapy, 159*, 104203. https://doi.org/10.1016/j.brat.2022.104203

Olatunji, B. O., Cisler, J. M., McKay, D., & Phillips, M. L. (2007). Is disgust associated with psychopathology? Emerging research in the anxiety

disorders. *Psychiatry Research, 157*(1-3), 1–17. https://doi.org/10.1016/j.psychres.2007.06.001

Olendzki, N., Elkins, G., Slonena, E., Hung, J., & Rhodes, J. (2020). Mindful hypnotherapy to reduce stress and increase mindfulness: A randomized controlled pilot study. *International Journal of Clinical and Experimental Hypnosis, 68*(2), 151–166. https://doi.org/10.1080/00207144.2020.1722028

Ollendick, T. H., & Davis III, T. E. (2013). One-session treatment for specific phobias: A review of Öst's single-session exposure with children and adolescents. *Cognitive Behaviour Therapy, 42*(4), 275–283. https://doi.org/10.1080/16506073.2013.773062

Olsson, A., & Phelps, E. A. (2004). Learned fear of "unseen" faces after Pavlovian, observational, and instructed fear. *Psychological Science, 15*(12), 822–828. https://doi.org/10.1111/j.0956-7976.2004.00762.x

Ong, C. W., Skolnik, A. M., Johnson, H. M., Krafft, J., Loew, S., Kurtz, A. J., & Lee, E. B. (2024). Sociodemographic representation in randomized controlled trials for anxiety-related disorders in the US: A systematic review (1993–2023). *Clinical Psychology Review, 111*, 102446. https://doi.org/10.1016/j.cpr.2024.102446

Opriş, D., Pintea, S., García-Palacios, A., Botella, C., Szamosközi, Ş., & David, D. (2012). Virtual reality exposure therapy in anxiety disorders: A quantitative meta-analysis. *Depression and Anxiety, 29*(2), 85–93. https://doi.org/10.1002/da.20910

Oren, E., & Solomon, R. (2012). EMDR therapy: An overview of its development and mechanisms of action. *European Review of Applied Psychology, 62*(4), 197–203. https://doi.org/10.1016/j.erap.2012.08.005

Öhman, A. (1986). Face the beast and fear the face: Animal and social fears as prototypes for evolutionary analyses of emotion. *Psychophysiology, 23*(2), 123–145. https://doi.org/10.1111/j.1469-8986.1986.tb00608.x

Öhman, A. (2008). Fear and anxiety: Overlaps and dissociations. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed., pp. 709–729). Guilford Press.

Öst, L. G. (1989). One-session treatment for specific phobias. *Behaviour Research and Therapy, 27*(1), 1–7. https://doi.org/10.1016/0005-7967(89)90113-7

Öst, L. G., Alm, T., Brandberg, M., & Breitholtz, E. (2001). One vs five sessions of exposure and five sessions of cognitive therapy in the treatment of claustrophobia. *Behaviour Research and Therapy, 39*(2), 167–183. https://doi.org/10.1016/S0005-7967(99)00176-X

Öst, L. G., Brandberg, M., & Alm, T. (1997). One versus five sessions of exposure in the treatment of flying phobia. *Behaviour Research and Therapy, 35*(11), 987–996. https://doi.org/10.1016/S0005-7967(97)00077-6

Palmer, S., Bor, R., & Josse, J. (2000). A self-help tool kit for conquering fears and anxieties about flying. *Counselling Psychology Review, 15*(2), 18–29.

Parnell, L. (1996). Eye movement desensitization and reprocessing (EMDR) and spiritual unfolding. *Journal of Transpersonal Psychology, 28*(2), 129–153.

Parsons, S., & Cobb, S. (2011). State-of-the-art of virtual reality technologies for children on the autism spectrum. *European Journal of Special Needs Education, 26*(3), 355–366. https://doi.org/10.1080/08856257.2011.593831

Parsons, T. D. (2008). *Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis* [Doctoral dissertation, University of Southern California].

Parsons, T. D., & Rizzo, A. A. (2008). Affective outcomes of virtual reality exposure therapy for anxiety and specific phobias: A meta-analysis. *Journal of Behavior Therapy and Experimental Psychiatry, 39*(3), 250–261. https://doi.org/10.1016/j.jbtep.2007.07.007

Pedreira, M. E., Pérez-Cuesta, L. M., & Maldonado, H. (2004). Mismatch between what is expected and what actually occurs triggers memory reconsolidation or extinction. *Learning & Memory, 11*(5), 579–585. https://doi.org/10.1101/lm.76904

Pegasus Havayolları. (2022). Yıldırım çarpması. Retrieved from https://www.flypgs.com/seyahat-sozlugu/yildirim-carpmasi

Pelissolo, A., Zaoui, M., Aguayo, G., Yao, S. N., Roche, S., Ecochard, R., ... & Cottraux, J. (2012). Virtual reality exposure therapy versus cognitive behavior therapy for panic disorder with agoraphobia: A randomized comparison study. *Journal of CyberTherapy and Rehabilitation, 5*(1), 35–43.

Perpiñá, C., Botella, C., & Baños, R. M. (2003). Virtual reality in eating disorders. *European Eating Disorders Review, 11*(3), 261–278. https://doi.org/10.1002/erv.520

Perri, R. L., Castelli, P., La Rosa, C., Zucchi, T., & Onofri, A. (2021). COVID-19, isolation, quarantine: On the efficacy of internet-based eye movement desensitization and reprocessing (EMDR) and cognitive-behavioral therapy (CBT) for ongoing trauma. *Brain Sciences, 11*(5), 579. https://doi.org/10.3390/brainsci11050579

Pittig, A., Stevens, S., Vervliet, B., Treanor, M., Conway, C. C., Zbozinek, T. D., & Craske, M. G. (2015). Maximizing exposure therapy An inhibitory learning approach. *Psychotherapeut, 60*(5), 401–418. https://doi.org/10.1007/s00278-015-0042-7

Pourmand, A., Davis, S., Marchak, A., Whiteside, T., & Sikka, N. (2018). Virtual reality as a clinical tool for pain management. *Current Pain and Headache Reports, 22*(8), 53. https://doi.org/10.1007/s11916-018-0708-2

Powers, M. B., & Emmelkamp, P. M. (2008). Virtual reality exposure therapy for anxiety disorders: A meta-analysis. *Journal of Anxiety Disorders, 22*(3), 561–569. https://doi.org/10.1016/j.janxdis.2007.04.006

Price, M., Anderson, P., & Rothbaum, B. O. (2008). Virtual reality as treatment for fear of flying: A review of recent research. *International Journal of Behavioral Consultation and Therapy, 4*(4), 340–347. https://doi.org/10.1037/h0100865

Remes, O., Brayne, C., Van Der Linde, R., & Lafortune, L. (2016). A systematic review of reviews on the prevalence of anxiety disorders in adult populations. *Brain and Behavior, 6*(7), e00497. https://doi.org/10.1002/brb3.497

Repetto, C., Gaggioli, A., Pallavicini, F., Cipresso, P., Raspelli, S., & Riva, G. (2013). Virtual reality and mobile phones in the treatment of generalized anxiety disorders: A phase-2 clinical trial. *Personal and Ubiquitous Computing, 17*(2), 253–260. https://doi.org/10.1007/s00779-011-0467-0

Reynolds, G., Askew, C., & Field, A. P. (2018). Behavioral inhibition and the associative learning of fear. In K. Pérez-Edgar & N. A. Fox (Eds.), *Behavioral inhibition: Integrating theory, research, and clinical perspectives* (pp. 263–282). Springer. https://doi.org/10.1007/978-3-319-98077-5_12

Ribé-Viñes, J. M., Gutiérrez-Maldonado, J., Zabolipour, Z., & Ferrer-García, M. (2023). Efficacy of virtual reality-based exposure therapy for the treatment of fear of flying: A systematic review. *The Cognitive Behaviour Therapist, 16*, e20. https://doi.org/10.1017/S1754470X23000028

Rizzo, A., Pair, J., McNerney, P. J., Eastlund, E., Manson, B., Gratch, J., ... & Swartout, B. (2005). Development of a VR therapy application for Iraq war military personnel with PTSD. *Studies in Health Technology and Informatics, 111*, 407–413.

Roberts, A., & Williams, R. (2018). Cognitive restructuring versus imaginal exposure: A comparison of therapeutic outcomes. *Behavioral Research and Therapy, 52*(2), 99-108. https://doi.org/10.1016/j.brat.2018.01.003

Rothbaum, B. O., Anderson, P., Zimand, E., Hodges, L., Lang, D., & Wilson, J. (2006). Virtual reality exposure therapy and standard (in vivo) exposure therapy in the treatment of fear of flying. *Behavior Therapy, 37*(1), 80–90. https://doi.org/10.1016/j.beth.2005.04.004

Rothbaum, B. O., Hodges, L., & Ready, D. (2019). Virtual reality exposure therapy for flight phobia: A randomized controlled trial. *Depression and Anxiety, 36*(6), 523–531. https://doi.org/10.1002/da.22871

Rothbaum, B. O., Hodges, L., & Smith, S. (1999). Virtual reality exposure therapy abbreviated treatment manual: Fear of flying application. *Cognitive and Behavioral Practice, 6*(3), 234–244. https://doi.org/10.1016/S1077-7229(99)80081-2

Rothbaum, B. O., Hodges, L., Watson, B. A., Kessler, G. D., & Opdyke, D. (1996). Virtual reality exposure therapy in the treatment of fear of flying: A case report. *Behaviour Research and Therapy, 34*(5-6), 477–481. https://doi.org/10.1016/0005-7967(96)00007-1

Rothbaum, B. O., Jovanovic, T., & Rizzo, A. S. (2017). Virtual reality exposure therapy for anxiety and related disorders. In B. O. Rothbaum & P. C. McLeod (Eds.), *Handbook of anxiety and related disorders* (pp. 165–189). Springer. https://doi.org/10.1007/978-1-4939-6470-9_9

Rothbaum, B. O., Zimand, E., Hodges, L., Lang, D., & Wilson, J. (2006). Virtual reality exposure therapy and standard (in vivo) exposure therapy in the treatment of fear of flying. *Behavior Therapy, 37*(1), 80–90. https://doi.org/10.1016/j.beth.2005.04.004

Rus-Calafell, M., Gutiérrez-Maldonado, J., Botella, C., & Baños, R. M. (2013). Virtual reality exposure and imaginal exposure in the treatment of fear of flying: A pilot study. *Behavior Modification, 37*(4), 568–590. https://doi.org/10.1177/0145445513482969

Saadat, S., Izadi, M., Ahmadi, K., & Shahyad, S. (2014). Non-Pharmacologic Treatments for Fear of Flying. *International Journal of Travel Medicine and Global Health, 2*(1), 31–37.

Sah, P. (2017). Fear, anxiety, and the amygdala. *Neuron, 96*(1), 1–2. https://doi.org/10.1016/j.neuron.2017.09.013

Sauer, K. S., & Witthöft, M. (2022). Inhibitory learning versus habituation in an experimental exposure intervention for people with heightened health anxiety: Increase of distress tolerance as a joint mechanism of change? *Journal of Experimental Psychopathology, 13*(4), 20438087221138716. https://doi.org/10.1177/20438087221138716

Sawyer, A., Ayers, S., & Smith, H. (2010). Pre-and postnatal psychological wellbeing in Africa: A systematic review. *Journal of Affective Disorders, 123*(1-3), 17–29. https://doi.org/10.1016/j.jad.2009.06.018

Scelles, C., & Bulnes, L. C. (2021). EMDR as treatment option for conditions other than PTSD: A systematic review. *Frontiers in Psychology, 12*, 644369. https://doi.org/10.3389/fpsyg.2021.644369

Schröder, D., et al. (2023). Impact of virtual reality applications in the treatment of anxiety disorders: A systematic review and meta-analysis of randomized-controlled trials. *Journal of Behavior Therapy and Experimental Psychiatry, 81*, 101893. https://doi.org/10.1016/j.jbtep.2023.101893

Seligman, M. E. (1970). On the generality of the laws of learning. *Psychological Review, 77*(5), 406–418. https://doi.org/10.1037/h0029790

Seligman, M. E. P. (1971). Phobias and preparedness. *Behavior Therapy, 2*(3), 307–320. https://doi.org/10.1016/S0005-7894(71)80064-3

Sevenster, D., Beckers, T., & Kindt, M. (2013). Prediction error governs pharmacologically induced amnesia for learned fear. *Science, 339*(6121), 830–833. https://doi.org/10.1126/science.1231357

Seydaoğulları, Ö., & Sarı, İ. (2023). Spor yaralanmalarında EMDR terapisinin işlevselliği: Bir olgu sunumu [The functionality of EMDR therapy in sports injuries: A case report]. *AYNA Klinik Psikoloji Dergisi, 10*(3), 589–611. https://doi.org/10.31682/ayna.1220792

Shapiro, F., Wesselmann, D., & Mevissen, L. (2017). *Eye Movement Desensitization and Reprocessing Therapy (EMDR)* (pp. 273–297). Springer, Cham. https://doi.org/10.1007/978-3-319-46138-0_13

Shapiro, F. (1995). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures* (1st ed.). Guilford Press.

Shapiro, F. (1999). Eye movement desensitization and reprocessing (EMDR) and the anxiety disorders: Clinical and research implications of an integrated psychotherapy treatment. *Journal of Anxiety Disorders, 13*(1-2), 35–67. https://doi.org/10.1016/S0887-6185(98)00038-3

Shapiro, F. (2001). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures* (2nd ed.). Guilford Press.

Shiban, Y., Diemer, J., Müller, J., Brütting-Schick, J., Pauli, P., & Mühlberger, A. (2017). Diaphragmatic breathing during virtual reality exposure therapy for aviophobia: Functional coping strategy or avoidance behavior? A pilot study. *BMC Psychiatry, 17*(1), 29. https://doi.org/10.1186/s12888-016-1181-2

Shin, B., Oh, J., Kim, B. H., Kim, H. E., Kim, H., Kim, S., & Kim, J. J. (2021). Effectiveness of self-guided virtual reality–based cognitive behavioral therapy for panic disorder: Randomized controlled trial. *JMIR Mental Health, 8*(11), e30590. https://doi.org/10.2196/30590

Simpson, S. G., & Reid, C. L. (2014). Therapeutic alliance in videoconferencing psychotherapy: A review. *Australian Journal of Rural Health, 22*(6), 280–299. https://doi.org/10.1111/ajr.12149

Skolnick, R. B., Schare, M. L., Wyatt, K. P., & Tillman, M. A. (2012). Aviophobia assessment: Validating the Flight Anxiety Situations Questionnaire as a clinical identification measure. *Journal of Anxiety Disorders, 26*(8), 779–784. https://doi.org/10.1016/j.janxdis.2012.07.006

Smith, P., & Jones, K. (2020). Addressing the emotional factors in systematic desensitization: A review of recent studies. *Journal of Anxiety Disorders, 59*, 28-35. https://doi.org/10.1016/j.janxdis.2020.01.004

Smith, T., et al. (2022). Acute pharmacological interventions for flight anxiety. *Journal of Anxiety Disorders, 30*, 101-110. https://doi.org/XXX

Spence, J., Titov, N., Johnston, L., Dear, B. F., Wootton, B., Terides, M., & Zou, J. (2013). Internet-delivered eye movement desensitization and reprocessing (iEMDR): An open trial. *F1000Research, 2*, 79. https://doi.org/10.12688/f1000research.2-79.v2

Spiegel, D., Maruffi, B., Frischholz, E. J., & Spiegel, H. (1981). Hypnotic responsivity and the treatment of flying phobia. *American Journal of Clinical Hypnosis, 23*(4), 239–247. https://doi.org/10.1080/00029157.1981.10404043

Stickgold, R. (2002). EMDR: A putative neurobiological mechanism of action. *Journal of clinical psychology*, *58*(1), 61-75.

Stoll, J., Müller, J., & Trachsel, M. (2020). Ethical issues in online psychotherapy: A narrative review. *Frontiers in Psychiatry, 10*, 993. https://doi.org/10.3389/fpsyt.2019.00993

Strickland, D. (1997). Virtual reality for the treatment of autism. In G. Riva (Ed.), *Virtual reality in neuro-psycho-physiology* (pp. 81–86). IOS Press.

Strickland, D., Marcus, L. M., Mesibov, G. B., & Hogan, K. (1996). Brief report: Two case studies using virtual reality as a learning tool for autistic children. *Journal of Autism and Developmental Disorders, 26*(6), 651–659. https://doi.org/10.1007/BF02172354

Suso-Ribera, C., Fernández-Álvarez, J., García-Palacios, A., Hoffman, H. G., Bretón-López, J., Banos, R. M., ... & Botella, C. (2019). Virtual reality, augmented reality, and in vivo exposure therapy: A preliminary comparison of treatment efficacy in small animal phobia. *Cyberpsychology, Behavior, and Social Networking, 22*(1), 31–38. https://doi.org/10.1089/cyber.2018.0220

Tabachnick, B. G., & Fidell, L. S. (2019). Using multivariate statistics (7th Ed.).

Tarrier, N., Sommerfield, C., Pilgrim, H., & Humphreys, L. (2018). Cognitive therapy or imaginal exposure in the treatment of post-traumatic stress disorder: Twelve-month follow-up. *British Journal of Psychiatry, 172*(3), 256–259. https://doi.org/10.1192/bjp.172.3.256

Tesarz, J., Leisner, S., Gerhardt, A., Janke, S., Seidler, G. H., Eich, W., & Hartmann, M. (2014). Effects of eye movement desensitization and reprocessing (EMDR) treatment in chronic pain patients: A systematic review. *Pain Medicine, 15*(2), 247–263. https://doi.org/10.1111/pme.12303

Tortella-Feliu, M., Botella, C., Llabrés, J., Bretón-López, J., del Amo, A. R., & Baños, R. M. (2011). Virtual reality exposure and imaginal exposure in the treatment of fear of flying: A pilot study. *Behaviour Research and Therapy, 49*(12), 880–885. https://doi.org/10.1016/j.brat.2011.09.005

Triscari, M. T., Faraci, P., Catalisano, D., D'Angelo, V., & Urso, V. (2015). Effectiveness of cognitive behavioral therapy integrated with systematic desensitization, cognitive behavioral therapy combined with eye movement desensitization and reprocessing therapy, and cognitive behavioral therapy combined with virtual reality exposure therapy methods in the treatment of flight anxiety: A randomized trial. *Neuropsychiatric Disease and Treatment, 11*, 2591–2598. https://doi.org/10.2147/NDT.S93401

Triscari, M., Faraci, P., D'Angelo, V., Urso, V., & Catalisano, D. (2010). *Description and effectiveness of two standardized treatment programs for the fear of flying: CB Therapy and EMDR Therapy* [Paper presentation]. European Association for Aviation Psychology (EAAP) Conference "Performance, Safety and Well-being in Aviation". XXX.

Tsamitros, N., Sebold, M., Gutwinski, S., & Beck, A. (2021). Virtual reality-based treatment approaches in the field of substance use disorders. *Current Addiction Reports, 8*(3), 399–407. https://doi.org/10.1007/s40429-021-00373-9

Türkçapar, H. (2022). *Bilişsel davranışçı psikoterapi nedir?* [Psikoeğitim kitapçığı].

Türkçapar, H. (2022). *Kaygı (Anksiyete) bozukluğu* [Psikoeğitim kitapçığı].

Ucakkazalari. (2000, April 8). *Yakıtı biten uçak uçabilir mi? Ne kadar uçar?* Retrieved from https://www.ucakkazalari.com/yakiti-biten-ucak-ucabilir-mi-ne-kadar-ucar/

Valiente-Gómez, A., Moreno-Alcázar, A., Treen, D., Cedrón, C., Colom, F., Perez, V., & Amann, B. L. (2017). EMDR beyond PTSD: A systematic literature review. *Frontiers in Psychology, 8*, 1668. https://doi.org/10.3389/fpsyg.2017.01668

Van Den Hout, M., Muris, P., Salemink, E., & Kindt, M. (2001). Autobiographical memories become less vivid and emotional after eye movements. *British Journal of Clinical Psychology, 40*(2), 121–130. https://doi.org/10.1348/014466501163571

Wang, H. I., Wright, B., Tindall, L., Cooper, C., Biggs, K., Lee, E., ... & Parrott, S. (2022). Cost and effectiveness of one session treatment (OST) for children and young people with specific phobias compared to multi-session cognitive behavioural therapy (CBT): Results from a randomised controlled trial. *BMC Psychiatry, 22*(1), 547. https://doi.org/10.1186/s12888-022-04176-8

Wang, M., & Reid, D. (2011). Virtual reality in pediatric neurorehabilitation: Attention deficit hyperactivity disorder, autism and cerebral palsy. *Neuroepidemiology, 36*(1), 2–18. https://doi.org/10.1159/000320847

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*(1), 1–14. https://doi.org/10.1037/h0069608

Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., Erskine, H. E., ... & Vos, T. (2013). Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. *The Lancet, 382*(9904), 1575–1586. https://doi.org/10.1016/S0140-6736(13)61611-6

Wiederhold, B. K. (2018). Are we ready for online virtual reality therapy? *Cyberpsychology, Behavior, and Social Networking, 21*(6), 341–342. https://doi.org/10.1089/cyber.2018.29114.bkw

Wiederhold, B. K., & Bouchard, S. (2020). *Virtual reality therapy for anxiety disorders: Advances in evaluation and treatment*. American Psychological Association.

Wiederhold, B. K., Gevirtz, R. N., & Spira, J. L. (2001). Virtual reality exposure therapy vs. imagery desensitization in the treatment of flying phobia. In G. Riva & C. Galimberti (Eds.), *Towards cyberpsychology: Mind, cognitions and society in the internet age* (pp. 253–272). IOS Press.

Wiederhold, B. K., Jang, D. P., Gevirtz, R. G., Kim, S. I., Kim, I. Y., & Wiederhold, M. D. (2002). The treatment of fear of flying: A controlled study of imaginal and virtual reality graded exposure therapy. *IEEE Transactions on Information Technology in Biomedicine, 6*(3), 218–223. https://doi.org/10.1109/TITB.2002.802378

Wiederhold, B. K., & Riva, G. (2019). Virtual reality therapy: Emerging topics and future challenges. *Cyberpsychology, Behavior, and Social Networking, 22*(1), 3–6. https://doi.org/10.1089/cyber.2018.29136.bkw

Wiederhold, B. K., & Wiederhold, M. D. (1998). A review of virtual reality as a psychotherapeutic tool. *CyberPsychology & Behavior, 1*(1), 45–52. https://doi.org/10.1089/cpb.1998.1.45

Wiederhold, B. K., & Wiederhold, M. D. (2003). Three-year follow-up for virtual reality exposure for fear of flying. *CyberPsychology & Behavior, 6*(4), 441–445. https://doi.org/10.1089/109493103322278844

Wiederhold, B. K., & Wiederhold, M. D. (2019). Virtual reality therapy for anxiety disorders: Advances in evaluation and treatment. *Cyberpsychology, Behavior, and Social Networking, 22*(1), 3–6. https://doi.org/10.1089/cyber.2019.0003

Wofford, N., Snyder, M., Corlett, C., & Elkins, G. (2023). Systematic review of hypnotherapy for sleep and sleep disturbance. *International Journal of Clinical and Experimental Hypnosis, 71*(3), 176–215. https://doi.org/10.1080/00207144.2023.2226177

Wolpe, J. (1969). *The practice of behavior therapy*. Pergamon Press.

Wolpe, J., & Rachman, S. (1960). Psychoanalytic "evidence": A critique. *Journal of Nervous and Mental Disease, 131*(2), 135-148. https://doi.org/10.1097/00005053-196008000-00007

Wong, S. L. (2019). Flash technique group protocol for highly dissociative clients in a homeless shelter: A clinical report. *Journal of EMDR Practice and Research, 13*(1), 20–31. https://doi.org/10.1891/1933-3196.13.1.20

Wong, S. L. (2021). A model for the flash technique based on working memory and neuroscience research. *Journal of EMDR Practice and Research, 15*(3), 174–184. https://doi.org/10.1891/EMDR-D-20-00045

Wootton, B. M., Steinman, S. A., Czerniawski, A., Norris, K., Baptie, C., Diefenbach, G., & Tolin, D. F. (2018). An evaluation of the effectiveness of a transdiagnostic bibliotherapy program for anxiety and related disorders: Results from two studies using a benchmarking approach. *Cognitive Therapy and Research, 42*(5), 565–580. https://doi.org/10.1007/s10608-018-9918-5

World Health Organization. (2023). *Global guidelines for anxiety management*. WHO Press.

Yaşar, A. B., Gündoğmuş, İ., Gündüz, A., & Konuk, E. (2019). Investigation of the effect single session of "Flash Technique" at a group. *Klinik Psikofarmakoloji Bülteni, 29*(Suppl 1), S73.

Yaşar, A. B., Gündoğmuş, İ., Gündüz, A., & Konuk, E. (2021). The effects of single session EMDR flash technique group application on traumatic symptoms. *Israel Journal of Psychiatry, 58*(2), 41–46.

Yaşar, A. B., Konuk, E., Kavakçı, Ö., Uygun, E., Gündoğmuş, İ., Taygar, A. S., & Uludağ, E. (2022). A randomized-controlled trial of EMDR flash technique on traumatic symptoms, depression, anxiety, stress, and life of quality with individuals who have experienced a traffic accident. *Frontiers in Psychology, 13*, 845481. https://doi.org/10.3389/fpsyg.2022.845481

Yılmaz, M. C. (2020, June 9). *Uçuş sırasında uçağın motoru bozulursa ne olur?* Webtekno. Retrieved from https://www.webtekno.com/ucus-sirasinda-ucagin-motoru-bozulursa-ne-olur-h86786.html

Young, J., & Rycroft, P. (2012). Single session therapy: What's in a name? *Australian and New Zealand Journal of Family Therapy, 33*(1), 3–5. https://doi.org/10.1017/aft.2012.1

Young, K., & Jebreen, J. (2019). Recognizing single-session therapy as psychotherapy. *Journal of Systemic Therapies, 38*(4), 31–44. https://doi.org/10.1521/jsyt.2019.38.4.31

Yuan, S., Zhou, X., Zhang, Y., Zhang, H., Pu, J., Yang, L., Liu, L., Jiang, X., & Xie, P. (2018). Comparative efficacy and acceptability of bibliotherapy for depression and anxiety disorders in children and adolescents: A meta-analysis

of randomized clinical trials. *Neuropsychiatric Disease and Treatment, 14*, 353–365. https://doi.org/10.2147/NDT.S152747

Yunitri, N., Kao, C., Chu, H., Voss, J., Chiu, H., Liu, D., Shen, S., Chang, P., Kang, X., & Chou, K. (2020). The effectiveness of eye movement desensitization and reprocessing toward anxiety disorder: A meta-analysis of randomized controlled trials. *Journal of Psychiatric Research, 123*, 102–113. https://doi.org/10.1016/j.jpsychires.2020.01.005

APPENDICES

APPENDIX A

DEMOGRAPHIC INFORMATION SHEET

1. Cinsiyet:
   - Kadın
   - Erkek

2. Uyruk
   - Türkiye Cumhuriyeti
   - Diğer

3. Medeni Durum:
   - Bekar
   - Evli
   - Boşanmış
   - Dul
   - Diğer

4. Hangi şehirde ikamet ediyorsunuz?
   - İstanbul
   - Ankara
   - Diğer

5. Eğitim düzeyiniz
   - İlkokul
   - Ortaokul
   - Lise
   - Üniversite

- Yüksek lisans
- Doktora

6. Herhangi bir kronik rahatsızlığınız var mı? Evet ise nedir?
   - Evet
   - Hayır

7. Düzenli olarak kullandığınız (en az bir yıldır) herhangi bir ilaç kullanıyor musunuz? Evet ise nedir?
   - Evet
   - Hayır

8. Daha önce hiç uçak yolculuğu yaptınız mı?
   - Evet 1-3 kez
   - Evet 4-6 kez
   - Evet 7-10
   - Evet 10'dan fazla
   - Hayır

9. (Yukarıdaki soruya hayır dediyseniz) bunun nedeni aşağıdakilerden hangisidir?
   - Uçuş korkusu
   - Maddi kısıtlılık
   - İhtiyaç hissetmeme
   - Diğer

10. Sıklığına bakılmaksızın kaç yıldan beridir uçmaktasınız?
    - Hiç uçmadım
    - 1-5 yıldır
    - 6-10 yıldır
    - 11-15 yıldır
    - 16-20 yıldır
    - 20 yıldan fazla

11. En son uçuşunuz ne zamandı?
    - Hiç
    - 1-5 yıl önce
    - 6-10 yıl önce
    - 11-15 yıl önce
    - 16-20 yıl önce
    - 20 yıl önce

12. Uçuş korkusunu ne zamandır yaşıyorsunuz?
    - 1 yıldan az
    - 1-5 yıldır
    - 6-10 yıldır
    - 11-15 yıldır
    - 16-20 yıldır
    - 20 yıldan fazla

13. Uçuş korkusu başlamadan önceki yaklaşık uçuş sayınız nedir?
    - 0
    - 1-5
    - 6-10
    - 15-20
    - 21-25
    - 26-daha fazla

14. Uçuş korkusu başladıktan sonraki yaklaşık uçuş sayınız nedir?
    - 0
    - 1-5
    - 6-10
    - 15-20
    - 21-25
    - 26-daha fazla

15. Şu anda yaklaşık ne sıklıkla uçuyorsunuz?

- Hiç
- Her hafta
- Her ay
- Yılda birkaç kez

16. Uçak korkusuyla başa çıkma davranışı

- Uçmaktan kaçınmak
- Alkol almak
- İlaç veya rahatlatıcı şeyler almak
- Uyumak
- Dua etmek
- Ekran izlemek/Oyun oynama vb
- Diğer_____

APPENDIX B

FLIGHT ANXIETY SITUATIONS QUESTIONNAIRE (FAS)

Table B.1. Flight Anxiety Situations Questionnaire (FAS) Questions

Çeşitli Uçuş Durumlarında Korkunun Ölçülmesi

Aşağıda uçakta bulunabileceğini bazı anlar yer almaktadır. Lütfen aşağıda belirtilen durumlarda ne düzeyde kaygı yaşadığınızı belirtiniz. Numaralar 1'den 5'e kadar sıralanmıştır, 1 =hiç kaygı yok, 2 = az kaygı, 3 = orta düzeyde kaygı, 4 = yoğun kaygı, 5 = çok yoğun (üstesinden gelinemez düzeyde) kaygı

	Madde	**1**	**2**	**3**	**4**	**5**
1	Uçak gördüğünde	Hiç	Az	Orta	Yoğun	Çok yoğun
2	Uçak sesi duyduğunda	Hiç	Az	Orta	Yoğun	Çok yoğun
3	Uçuş hakkında bir yazı okuduğunda	Hiç	Az	Orta	Yoğun	Çok yoğun
4	Birini havaalanına götürdüğünde	Hiç	Az	Orta	Yoğun	Çok yoğun
5	Arkadaşların bir uçuştan bahsederken	Hiç	Az	Orta	Yoğun	Çok yoğun
6	Uçağa binmeye karar verdiğinde	Hiç	Az	Orta	Yoğun	Çok yoğun
7	Uçak bileti alırken	Hiç	Az	Orta	Yoğun	Çok yoğun
8	Havaalanına giderken	Hiç	Az	Orta	Yoğun	Çok yoğun
9	Giden yolcu terminaline girdiğinde	Hiç	Az	Orta	Yoğun	Çok yoğun
10	Pasaport kontrolünden geçerken	Hiç	Az	Orta	Yoğun	Çok yoğun

Table B.1. (cont.)

11	Uçağa biniş çağrısı için beklerken	Hiç	Az	Orta	Yoğun	Çok yoğun
12	Uçakların iniş kalkışlarını gördüğünde	Hiç	Az	Orta	Yoğun	Çok yoğun
13	Uçak motorlarının sesini/gürültüsünü duyduğunda	Hiç	Az	Orta	Yoğun	Çok yoğun
14	Biniş kapısına doğru yürürken	Hiç	Az	Orta	Yoğun	Çok yoğun
15	Güvenlik kontrolünden geçerken	Hiç	Az	Orta	Yoğun	Çok yoğun
16	Biniş kapısından geçerken	Hiç	Az	Orta	Yoğun	Çok yoğun
17	Uçak kabinine girerken	Hiç	Az	Orta	Yoğun	Çok yoğun
18	Uçak kapıları kapanırken	Hiç	Az	Orta	Yoğun	Çok yoğun
19	Kabin ekibi tarafından uçuş emniyet kurallarına ilişkin bilgi verilirken	Hiç	Az	Orta	Yoğun	Çok yoğun
20	Kalkış anonsu yapıldığında yapılırken	Hiç	Az	Orta	Yoğun	Çok yoğun
21	Kalkıştan önce motora tam güç verilirken	Hiç	Az	Orta	Yoğun	Çok yoğun
22	Kalkışta vücudunun geriye doğru itildiğini hissettiğinde	Hiç	Az	Orta	Yoğun	Çok yoğun
23	Uçuş sırasında bazı sesler duyduğunda	Hiç	Az	Orta	Yoğun	Çok yoğun
24	Uçak sağa veya sola yattığında	Hiç	Az	Orta	Yoğun	Çok yoğun

Table B.1. (cont.)

25	Uçağın kanatları hareket ederken veya titrerken	Hiç	Az	Orta	Yoğun	Çok yoğun
26	Kokpit tarafından mevcut irtifa veya uçuş durumu hakkında bilgi verilirken	Hiç	Az	Orta	Yoğun	Çok yoğun
27	Motorların sesi azalırken	Hiç	Az	Orta	Yoğun	Çok yoğun
28	Uçak alçalmaya başladığında	Hiç	Az	Orta	Yoğun	Çok yoğun
29	Türbülans anonsu yapıldığında	Hiç	Az	Orta	Yoğun	Çok yoğun
30	Sallanırken	Hiç	Az	Orta	Yoğun	Çok yoğun
31	Motor sesi tekrar arttığında	Hiç	Az	Orta	Yoğun	Çok yoğun
32	İniş anonsu yapılırken	Hiç	Az	Orta	Yoğun	Çok yoğun

APPENDIX C

FLIGHT ANXIETY MODALITY QUESTIONNAIRE (FAM)

Table C.1. Flight Anxiety Modality Questionnaire (FAM) Questions

Kaygımı nasıl ifade ederim? Lüften uçtuğunuz esnada tepkinizin şiddetine denk gelen sayıyı veya tepkinizin şiddetinin ne olduğunu işaretleyiniz. Sayılar 1 ile 5 arasında değişiklik gösterir; 1: hiç tepkisiz, 2: Az tepkili, 3: orta derecede tepkili, 4: yoğun tepkili, 5: çok yoğun tepkili anlamındadır.

Maddeler	**1**	**2**	**3**	**4**	**5**
33. Kol ve bacaklarımda uyuşmalar hissederim	Hiç	Az	Orta	Yoğun	Çok yoğun
34. Ölüm korkusu duyarım	Hiç	Az	Orta	Yoğun	Çok yoğun
35.Göğsümde ağrı hissederim	Hiç	Az	Orta	Yoğun	Çok yoğun
36. Ne olacağını tahmin edemem ve bu beni çok endişelendirir	Hiç	Az	Orta	Yoğun	Çok yoğun
37. Kalp çarpıntısı veya daha hızlı kalp atışı hissederim	Hiç	Az	Orta	Yoğun	Çok yoğun
38. Bir şeylerin yanlış gideceği düşüncesi hiç aklımdan çıkmaz	Hiç	Az	Orta	Yoğun	Çok yoğun
39. Gerginliğim sakarlaşmama yol açar ve elimden bir şeyler düşer	Hiç	Az	Orta	Yoğun	Çok yoğun
40. Kafam uçuşla ilgili korkutucu düşüncelerle meşgul olduğundan odaklanamam	Hiç	Az	Orta	Yoğun	Çok yoğun
41. Uçağın en ufak sesine ve hareketine dikkat kesilirim ve her şeyin yolunda olup olmadığını merak ederim	Hiç	Az	Orta	Yoğun	Çok yoğun
42. Sürekli olarak kabin ekibinin yüz ifadelerine ve davranışlarına dikkatimi veririm	Hiç	Az	Orta	Yoğun	Çok yoğun
43. Başım döner veya bayılacak gibi olurum	Hiç	Az	Orta	Yoğun	Çok yoğun

Table C.1. (cont.)

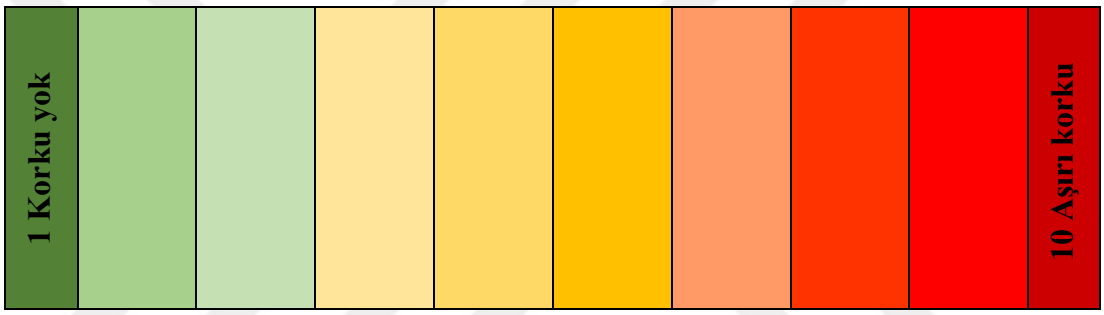
44. Kol ve bacaklarım gerginleşmiştir ve kasılmıştır, bu yüzden hareket etme ve yürüme ihtiyacı hissederim.	Hiç	Az	Orta	Yoğun	Çok yoğun
45. Nefesim daralır.	Hiç	Az	Orta	Yoğun	Çok yoğun
46. Boğulacak gibi hissederim.	Hiç	Az	Orta	Yoğun	Çok yoğun
47. Ağzım kurur.	Hiç	Az	Orta	Yoğun	Çok yoğun
48. İçinde bulunduğum uçak düşecek zannederim.	Hiç	Az	Orta	Yoğun	Çok yoğun
49. Aniden sıcak veya soğuk basar.	Hiç	Az	Orta	Yoğun	Çok yoğun
50. Korkudan bayılacağım hissine kapılırım.	Hiç	Az	Orta	Yoğun	Çok yoğun

APPENDIX D

VISUAL ANALOGUE FEAR OF FLYING SCALE

Table D.1. Visual Analogue Fear of Flying Scale Question

51. Lütfen 1'den 10'a kadar derecelendirilen ölçek üzerinde uçuş korkunuzu puanlayın.



APPENDIX E

THE CLINICAL GLOBAL IMPRESSIONS SCALE (CGI)

Hastanın Adı, Soyadı:	Tarih:
Hastanın Yaşı ve Cinsiyeti:	Değerlendirici:

KLİNİK GLOBAL İZLENİM ÖLÇEĞİ (CGI)

HASTALIK ŞİDDETİ

Bu hasta grubu ile olan klinik deneyimlerinize dayanarak, sizce bu kişi ne kadar hasta?

1. Normal, hasta değil ☐
2. Hastalık sınırında ☐
3. Hafif düzeyde hasta ☐
4. Orta düzeyde hasta ☐
5. Belirgin düzeyde hasta ☐
6. Ağır hasta ☐
7. Çok ağır hasta ☐

DÜZELME

Hastanın ilk değerlendirildiğindeki durumunu düşünürseniz, sizce bu hasta ne kadar değişti?

1. Çok düzeldi ☐
2. Oldukça düzeldi ☐
3. Biraz düzeldi ☐
4. Hiç değişiklik yok ☐
5. Biraz kötüleşti ☐
6. Oldukça kötüleşti ☐
7. Çok kötüleşti ☐

YAN ETKİ ŞİDDETİ

Bu maddeyi sadece ilaç etkisini gözönüne alarak değerlendiriniz. Yan etkiyi en iyi ifade eden seçeneği işaretleyiniz.

1. Hiç yok ☐
2. Hastanın işlevselliğini önemli derecede etkilemiyor ☐
3. Hastanın işlevselliğini önemli derecede etkiliyor ☐
4. Terapötik etkinin yararlarını gözardı ettirecek düzeyde etkiliyor ☐

Figure E.1. The Clinical Global Impressions Scale (CGI) Questionnaire

APPENDIX F

INFORMED CONSENT FORM

Sayın katılımcı,

Bu formun amacı mevcut projeyle ilgili bilgilendirmede bulunmak ve katılım ile ilgili onayınızı almaktır. “Sanal Gerçeklik Terapisi ve EMDR Flash Terapinin Online Versiyonlarının Uçuş Korkusu Tedavisi Üzerindeki Etkileri İçin Rastgele Kontrollü Bir Deneme Tasarımı” isimli çalışmaya katılmak üzere davet edilmiş bulunuyorsunuz. Bu araştırma İbn Haldun Üniversitesi Klinik Psikoloji Doktora Öğrencisi Zehra Özdil Arıkan tarafından, Prof. Dr. Üzeyir Ok danışmanlığında yürütülmektedir. Bu araştırmada yer almayı kabul etmeden önce lütfen aşağıdaki bilgilendirmeyi okuyunuz. Bu çalışma uçuş korkusunun tedavisine yönelik online uygulanacak olan 180 dakikalık bir tedavi protokolünü içermektedir. Seans planlanması terapist ile yapılacaktır. Bu çalışmaya katılmak için 6 sorudan oluşan demografik bilgi formunu, 32 sorudan oluşan Uçuş Kaygısı Durumları Ölçeği (FAS) ve 18 sorudan oluşan Uçuş Kaygısı Etkileri Ölçeği (FAM)’ni doldurmanız istenmektedir. Araştırmaya katılmanın size herhangi bir risk getirmesi beklenmemektedir.

Çalışmada yer almak tamamen sizin kararınıza bağlıdır. Çalışmada yer almayı kabul etmeyebilirsiniz veya yarıda bırakarak araştırmadan ayrılabilirsiniz. Bu çalışma verileri yalnızca bilimsel amaçlarla kullanılacaktır. Araştırmadan ayrılmanız durumunda size ait veriler kullanılmayacaktır fakat araştırmayı tamamlayıp verileriniz anonimleştikten sonra çekilmeniz mümkün olmayacaktır. Sizden elde edilen tüm veriler gizli tutulacaktır. Bu formu imzalamadan önce araştırmayla ilgili sorunuz varsa lütfen sorunuz. Araştırmacı ile aşağıdaki iletişim bilgileri üzerinden iletişime geçebilirsiniz.

Yukarda yer alan ve araştırmaya başlamadan önce katılımcılara verilmesi gereken bilgileri içeren metni okudum ve çalışmaya katılmayı onaylıyorum.

Araştırmacının adı: Zehra Özdil Arıkan

E-mail adresi:

APPENDIX G

WRITTEN FORM OF PSYCHOEDUCATION FOR EMDR FLASH TECHNIQUE

Araştırmalar her 100 kişiden 35'inin hayatının bir kısmında uçuş fobisi geliştirdiğini gösteriyor. (Foreman & van Gerwen, 2008). Uçuş korkusu klinik araştırmalar sayesinde başedilebilir hale gelmiştir. Artık yalnızca "kendini topla, korkacak birşey yok" demenin sorunla baş etmede etkin bir yöntem olmadığını biliyoruz.

Uçuş korkusuna birçok etken neden olabilir. Mesela:

• Uçuş sırasında yaşanan can sıkıcı bir deneyim, şiddetli bir türbülans veya korkutucu bir yaşantı

• Medyada veya filmlerde yer alan uçak kazası veya haberlerini okuma veya izleme. Bu deneyim sizin veya ailenizden biri için korkutucu olmuş olabilir.

• Gitmek istemediğiniz bir yere uçarken, uçuştan hemen önce veya sonra tatsız bir deneyim yaşama veya yaklaşan bir felaket duygusu yaşama

• Uçmadan önce veya uçuşta panik atak geçirme ve sonrasında kişinin tekrar eden deneyimlerden korkması ve bu nedenle endişeli hissetme beklentisi

gibi farklı nedenlerle gelişebilir ve insanların uçmaktan vazgeçmesine veya kaygıyla uçmasına yol açabilir.

Hepsini bir arada değerlendirirsek uçuşla ilgili korkuların iki ana nedeni vardır:

1. İlk olarak kişinin uçuşta bir olumsuzluk yaşayacağı ve yardım alamayacağı inancı. Örneğin; panikleme, kontrol kaybetme, dengesizlik, bayılma, kapalı alanda kalma, çıldırma, küçümsenme, sevdiğinden ayrılma, kalp krizi veya beyin kanaması geçirme gibi korkular

2. Uçağın düşeceği, kaza olacağı veya uçakta başka kötü bir durumun (havasızlık, türbülans gibi) olacağına yönelik korkular. Örneğin; türbülans, uçak kazası, motor arızası, çarpma, iniş-kalkış gibi durumlarla ilgili korkular

Siz bu gruplardan hangisine ait olduğunuzu düşünüyorsunuz?

Korku durumlarında tehdidin abartılması tipik bir hatadır. Karmaşık ve belirsiz durumlarla karşı karşıya kalındığında kaçmak ve kaçınmak anlık olarak daha iyi hissettirir fakat uzun vadede sorunu daha kronik hale getirecektir.

Uluslararası Hava Taşımacılığı Birliği raporuna göre havayolu en güvenli taşıma aracıdır. Havayolunda 1 milyon uçuş başına tüm kaza oranı 1,35'tir. Bununla birlikte ticari olarak uçan 100 milyon yolcuda yalnızca 1,27 ölüm tespit edilmiştir. En sık kullanılan araçlardan biri olan karayolu taşımacılığına bakıldığında ise dünyada her gün ortalama 3287 kişi trafik kazalarında ölmektedir. Her yıl karayolu kazalarında ölen 1,3 milyon kişiye ek olarak yaklaşık 20-50 milyon kişinin de yaralandığı ve sakatlandığı tahmin edilmektedir. Buna rağmen insanların uçuşun güvenliğiyle ilgili endişe duymaları anlaşılabilir bir durumdur. Çünkü dünyanın herhangi bir yerinde havacılıkla ilgili olan en ufak bir kaza hemen medyada servis edilir ama olaysız normallik haber değeri olmayan günlük 100.000 uçuştan hiç bahsedilmez. Basında aynı haber günlerce yayınlanır çünkü alıştığımızdan farklı bir durumdur.

Havacılıkta bugüne kadarki kazalara bakıldığında kazazedelerin %96'sının sağ olarak kurtulduğu görülüyor. Dünyada her yıl iki milyardan fazla yolcu taşınıyor. Havayolu taşımacılığında yolcuların %99,99'unun güvenli bir şekilde varış noktasında ulaştığı tespit edilmiş. ABD Ulusal Taşımacılık Güvenlik Kurulu raporuna göre dünya çağında on yıldan fazla bir süredir hayatını kaybeden kaza kurbanları, özel yüzme havuzlarında yalnızca 1 yılda meydana gelen ölümcül kazaların sayısına eşit olduğu tespit edilmiştir.

Bu çalışmada uçuş korkunuz için EMDR Flash Teknik uygulanacaktır. Flash Teknik (FT), travmatik veya diğer rahatsız edici anılarla ilişkili rahatsızlığı azaltmak için yakın zamanda geliştirilmiş bir terapötik müdahaledir. Flash Teknik, Göz Hareketleriyle Duyarsızlaştırma ve Yeniden İşleme (EMDR) terapisinin bir

protokolüdür ve danışanın travmatik anıları sıkıntı hissetmeden işlemesine izin verir. Flash teknikte de göz hareketlerini veya bedene çift yönlü uyaran göndermeyi kullanır ve beyindeki işlenmemiş travmatik anıları çözmek için tasarlanmıştır. Bazen on ila on beş dakika gibi kısa bir sürede, şiddetli rahatsız edici anılarla ilişkili rahatsızlık düzeyini azaltmada etkili olduğu gösterilmiştir.

- **BİLGİ GÜÇTÜR**

- *Aerodinamikler: Uçak nasıl uçar*

Küçük büyük fark etmeksizin her uçak aynı doğal olaya dayanarak uçar. Kâğıt uçaklar bile aynı fizik kanunlarından faydalanır. Uçma eylemi havanın belirli özelliklerine dayanarak gerçekleşir. Hava ağırlığı olan bir maddedir ve belirli bir yoğunluğu vardır. Hava her yerdedir, bir uçağın asla boşluğa düşme riski yoktur. Bir uçağı havaya almak ve orada tutmak için iki kuvvetin üstesinden gelinmesi gerekir: hız şeklinde itme ve kaldırma.

Başlangıçta pervaneler uçaklara itme sağlamak için kullanıldı, havayı geri itecek ve bu da uçağı ileri doğru itecek şekilde şekillendirilmiştir. Aslında suyu geri iten ve böylece gemiyi geri iten gemi pervanesi de tamamen aynı şekilde çalışır.

Bir jet motorunun çalışması, en iyi şişmiş ağzından hava kaçıran bir balon örneğiyle anlaşılabilir. Bir jet motoru da havayı emer, sıkıştırır, yakıtla yakar ve böylece büyük bir basınç oluşturur. Sonuç olarak hava motordan emildiğinden çok daha yüksek bir hızda çıkar. Motor ve onunla birlikte uçak tepki olarak ileri itilir. Ticari havayolu uçakları genelde jet motoruna sahiptir. Bir jet motoru pervaneli motora göre çok daha avantajlıdır çünkü:

• daha basit ve güçlüdür
• daha az hareketli parçadan oluşur
• aşınmaya daha az maruz kalır
• bakımı daha kolaydır
• ve en önemlisi daha güvenlidir.

Bir uçak uçtuğunda, kaldırma özel şekle sahip kanatlar tarafından sağlanır. Bir uçağın kanadının altı düz ve üst kısmı dışa doğru kavislidir. Motorlar uçağa hız verdiğinde hava kanatlarının üstünden geçer.

Kanadının üstünden geçen hava alttan geçen havadan daha uzun bir mesafe kat etmek zorundadır. Sonuç olarak, üstten akan hava, aynı zamanda daha büyük mesafeyi kat etmek için daha hızlı hareket eder ve kanadın üstünde, altından daha düşük bir basınca neden olur. Bu düşük basınç, uçağı yukarı doğru çeker veya adeta emer. Aynı doğal olay, bir kâğıt parçasının üst yüzeyinden üfleyerek evde kolayca gösterilebilir: kağıt, üstten akan hava tarafından yukarı doğru çekilir. Bir uçağın kaldırma kuvveti, kanatların şekline ve üzerlerinden geçen havanın hızına bağlıdır. Bunu anlamanın kolay bir yolu, huni havada hareket ederken kanadın üzerindeki havanın bir huninin daha küçük ucuna emildiğini hayal etmektir. Hava huniden çıktığında huninin boyutu daha büyüktür, bu nedenle hava yoğunluğu daha az olur.

- *Uçak ve Teknik*

Uçağın yapıldığı malzeme sağlam olmalı ancak belirli bir esneklik sunmalıdır, çünkü hava her zaman hareket halindedir. Kanatların esnekliği sayesinde havadaki türbülans veya girdaplardan dolayı herhangi bir problem yaşanmaz. Ayrıca, malzeme sıcaklıktaki büyük farklılıklara dayanabilmelidir. Örneğin, uçak sıcak bir ülkede havalanır ve seyir yüksekliğine çıkarsa, sıcaklık + 40° ila -60° Santigrat arasında değişebilir. Bir uçak tasarlanırken tüm bu faktörler dikkate alınır. Bir uçağın kanadı aşağı 8 metre yukarı 8 metre kadar esneyebilir.

Prototip yapıldıktan sonra, normalde uçağın test edilmesi için bir veya iki yıl harcanır. Üretici, ürünün her şekilde tatmin edici olduğuna ikna olana kadar havacılık otoritesine onay için sunulmaz. Ardından makine, tescil edileceği tüm ülkelerdeki tüm havacılık otoriteleri tarafından bir kez daha incelenir ve test edilir. Sadece havayolunun uçuşa elverişliliğinden emin olduğu zaman, uçağa bir tip sertifikası verilir.

- *Temel bilgiler*

Sertifikanın düzenlenmesinden sorumlu kurum ICAO (Uluslararası Sivil Havacılık Kurumu) olup, bundan sonra Türkiye'de SHGM (Sivil Havacılık Otoritesi)

bulunmaktadır. Tip sertifikasına ek olarak, belirli tipteki her bir hava aracının, konuşlanacağı ülkenin havacılık otoritesinden kendi uçuşa elverişlilik sertifikasını alması gerekir. İkinci sertifika yalnızca belirli bir süre için geçerli olduğundan, sertifikasının yenilenmesi için hava aracının düzenli aralıklarla tam denetimden geçmesi ve sertifikalandırılması gerekir.

Uçak sahibi ayrıca uçağın bakım, onarım ve revizyonu ile ilgili yönetmeliklere uymakla yükümlüdür. "Bakım" terimi, uçağı iyi ve uçuşa elverişli durumda tutmak için gerekli olan tüm periyodik faaliyetleri kapsar. Yalnızca kalifiye uzmanlar - özel olarak eğitilmiş mühendisler bakım yapabilir. Ulusal havacılık otoritesi, bakımın doğru ve gerekli zamanlarda yapıldığını kontrol eder. Her uçağın, bakımın doğru zamanlarda yapılıp yapılmadığını kontrol etmek için kullanılan belirli bir bakım programı vardır. Çoğu havayolunun bakım için kullandığı, alfabenin harfleriyle gösterilen beş türü vardır. Her uçuştan sonra yer mühendisleri bir inceleme yapar. Ek olarak, uçuş kaydedici (aslında turuncu-pembe renkli olmasına rağmen genellikle 'kara kutu' olarak bilinir) ve hava veri kaydedicisi uçağa olan her şeyi kaydeder. Örneğin, çok sert bir iniş otomatik olarak kaydedilir; kaptan asla böyle bir olayı örtbas edemez ve uçuştaki her türlü düzensizlik her zaman detaylı şekilde araştırılır.

Günümüzde uçakta, uçağın teknik durumu hakkında düzenli olarak kontroller yapan ve otomatik olarak havalimanına rapor gönderen bilgisayarlar bulunmaktadır (Uçak Haberleşme ve Raporlama Sistemi, ACARS). Herhangi bir şey olması gerektiği gibi olmazsa, uçak B bakımı dediğimiz şey için hangara gider. C bakımı çok daha kapsamlıdır ve uçak tipine bağlı olarak her 300-350 saatlik uçuştan sonra yapılır. D bakımı her 11-12 ayda bir yapılır ve kapsamlı bir incelemeyi içerir. Dört veya beş yıl sonra en büyük bakım görevi olan E bakımı gelir. Örneğin, bir Boeing 747 için bu, bu muayenenin, hangisi önce gerçekleşirse, beş yıl veya 26.000 uçuş saatinden sonra gerçekleştirileceği anlamına gelir. E bakımında yer alan çalışma yaklaşık iki ila üç ay sürer. Tüm uçak parçalara ayrılır; her somun ve cıvata dikkatlice kontrol edilir ve gerekirse değiştirilir. Neredeyse tüm uçak metal yorgunluğu, mikro çatlama ve korozyon açısından kontrol edilir. Kullanılan muayene teknikleri, X-ışını ve gama ışını incelemesini içerir. Daha sonra, uçak mükemmel teknik durumda ve muhtemelen yeni kadar iyi haldedir. Motorlar, iniş takımları ve aletler gibi birçok bileşenin, teknik departman tarafından her uçak için halledilen kendi ek bakım programı vardır.

- *Pilotlar*

Bir kişinin pilot olması için uzun yıllar geçmesi gerekir. Bir havayolu pilotu, uçuş eğitimine genellikle bir uçuş okulunda başlar. Her yıl çok sayıda insan bu kurumlara başvur, ancak yalnızca en iyileri katı seçim prosedürlerini geçmeyi başarır - başvuran her 100 kişiden sadece ikisi kabul edilir. Seçim süreci, kapsamlı bir tıbbi muayene ve psikolojik testler ile yetenek ve motivasyon incelemesini içerir.

Bir uçuş okulundaki eğitim yaklaşık iki yıl sürer ve geleceğin pilotları çeşitli uçak türlerini uçurmayı öğrenir. Genellikle iki yıl sonra, en yüksek pilot lisansı olan ATPL (Havayolu Taşımacılığı Pilot Lisansı) sertifikasına sahip olurlar. Bununla birlikte, yeterlilik sertifikası, pilotun herhangi bir uçak tipini uçurmasına izin vermez, sadece testin tamamlandığı belirli bir modele izin verir. Her uçak tipi için farklı bir sınav vardır.

Havacılık okulundan mezun olanlar kendilerine pilot diyebilirler, ancak bu hikâyenin henüz ilk adımıdır. Bundan sonra, pilotların başka bir tıbbi muayeneden geçmeleri ve deneyimlerini gerekli standartta tutmak için yıl boyunca yeterli sayıda saat uçmuş olmaları daha fazla pratik testten geçmeleri gerekir. Her şey yolundaysa, bir yıl yeterlilik sertifikası verilir.

Havacılık okulundan mezun olanlar, bir havayolunun uçuş kadrosuna katılmak için başvurabilirler. Kabul edilirlerse, ilgili şirket tarafından uçulan uçak türü hakkında eğitim almak için doğrudan eğitime geri dönerler. Teoride ustalaştıktan sonra, uçağı bir uçuş simülatöründe (yani pilot için uçak ortamı test edebildikleri sanal gerçeklik sistemine dayanan bir makinede) uçurmayı öğrenirler. Simülatör eğitiminde bir eğitmen eşliğinde dünyanın tüm havaalanlarında tüm hava koşullarında uçuşun çeşitli safhaları teorik ve pratik olarak test edilir. Her şey yolunda giderse pilot eğitime gerçek bir uçakta devam eder. Daha sonra kendi başına uçar, ancak yine de yanında oturan ve yapılan her şeyi dikkatle izleyen bir eğitmenin gözetimindedir. Bu şekilde yeni pilot gözlemci pilot olarak görev yapmaya başlar. Bu pilot iyi uçana kadar eğitmen eşliğinde uçmaya devam eder.

- *Kabin Ekibi*

Kabin ekibi havayolu şirketleri tarafından seçilir ve yetiştirilir. En önemli eğitimlerden biri uçuş güvenliğidir. Havacılık otoritelerine göre kapılar ve acil

çıkışların yarısı kapatılsa bile tüm yolcular 90 saniyede uçaktan tahliye edilebilmelidir. Bununla birlikte kabin ekibi ilk yardım eğitimleri gibi birçok eğitim almaktadırlar. Böylece kalp krizi gibi bir durumda müdahale etmenin yanı sıra bebek bile doğurtabilir. Belirli aralıklarla eğitimleri güncellenir.

- *Hava Trafik Kontrolörleri*

Hava trafik kontrolünün görevi, uçakları tüm dünyadaki rotaları boyunca yönlendirmek ve birbirlerine çok yaklaşmamalarını sağlamaktır. Hava trafik kontrolü, uçağın yeri görmeden bulutta uçmasını da mümkün kılar. Prensip olarak her ülkenin kendi hava trafik kontrolü vardır ve farklı kontrol merkezlerinin tümü birbiriyle iletişim halindedir. Hepsi Uluslararası Sivil Havacılık Organizasyonu tarafından belirlenen kuralları takip eder.

- *Uçaklar arası mesafe*

Uluslararası havaalanları, hava yolları, hava yoluyla on mil genişliğinde ve önceden belirlenmiş bir taban ve tavan yüksekliğine sahip hayali koridorlar ile birbirine bağlıdır. Uçakları havada çarpışmaktan korumak için Trafik Çarpışma ve Önleme Sistemi sistemi geliştirilmiştir. Bu sistem çevredeki uçakların transponder vasıtasıyla sorgulanması esasına göre çalışır ve diğer uçakların transponderlerini sorgulayarak çevreyi tarar ve uçağın verdiği sorgulamaya verilen cevaplar kullanılarak diğer uçakların göreli konumları belirlenir.

- *Türbülans*

Araştırmalar, türbülansın yolcular arasında uçmanın diğer yönlerinden daha fazla korkuya neden olduğunu göstermiştir. Asıl soru, elbette şudur: türbülans tehlikeli mi yoksa sadece rahatsız edici mi? Araştırmalar bize türbülansın bir güvenlik değil konfor sorunu olduğunu gösteriyor.

Uçuş korkusu olan birçok insan türbülanstan da korkar. Orta ila şiddetli türbülansın olduğu bir alanda uçuş sırasında, vücudun alarm zilleri çılgınca çalmaya başlar ve tehlike sinyalleri yanıp sönmeye başlar. Türbülans tehlikeyi çağrıştırır ve korku ortaya çıkar. Türbülans basitçe hareket halindeki havanın neden olduğu uçağın sarsılmasıdır. Hava ceplerinden kaynaklanmaz - aslında, atmosferin hiçbir yerinde vakum veya hava olmayan bir cep diye bir şey yoktur.

Hatırlamakta fayda var. Hava 'hiç' değildir. Hava 'bir şeydir'; meseledir ve parçacıklardan oluşur. Hava bir gazdır ve herhangi bir gazda olduğu gibi, parçacıklar bir sıvıda olduğu gibi hareket eder. Hava, tıpkı su gibi dalgalar halinde hareket eder. İki farklı akım ve dolayısıyla iki farklı dalga hareketi- birbiriyle karşılaştığında, suyun hareketi bozulur ve teknenin sarsıntılı hareketlerine neden olur. Aynı fenomen, farklı hızlara ve dalga hareketlerine sahip iki hava tabakası birbirini geçtiğinde ortaya çıkar. Atmosferimizde düzenli olarak birbirinin yanından geçen iki hava katmanına sahibiz. Biz yükseldikçe rüzgâr güçlenir ve yön değiştirir. Aslında havada uçan bir uçak, suda yüzen bir balığa benzer şekilde hareket eder. Sıcak havanın daha hafif olduğunu ve yükseldiğini, soğuk havanın ise daha yoğun olduğu için düştüğünü, farklı sıcaklıklardaki suda olduğu gibi anlamak önemlidir. Sıcak ve soğuk havanın bu yükselişi ve alçalması atmosferimizde dikey hareketlere neden olur ve doğal olarak uçak bunlara tepki verir.

Türbülans, bir uçağa veya herhangi bir parçasına ne gövdesine, ne kanatlarına, ne de yapısına zarar veremez. Uçaklar, şimdiye kadar gözlemlenen en güçlü türbülansın 2,5 katına dayanacak şekilde tasarlanmıştır. Gevşek nesneler düşüp hasara neden olabileceğinden, uçağın içindeki insanlar için rahatsız edici olabilir. Ama biz kendimiz koltuğumuza bağlandığımızda, aslında uçağa bağlıyız ve bize hiçbir şey olamaz.

- *Uçağa yıldırım çarparsa ne olur?*

Uçuş esnasında uçaklara yıldırım çarpabilir. Yapılan araştırmalara göre her yolcu uçağına yılda ortalama 1 kez yıldırım çarpmaktadır. Uçak, havada yıldırım çarpmasına maruz kalırsa güçlü bir ses eşliğinde parlak ışık ortaya çıkar ve sarsıntılar olabilir. Uçaklar Faraday kafesi konseptine uygun olarak tasarlanır. Yani yolcu uçağına yıldırım düşmesi durumunda yıldırım, uçak içine zarar vermeden havaya karışır. Ayrıca uçak gövdesindeki boya da antistatik özellikli yani elektiriğin birikmesini engelleyen şekilde olur. Bu da elektriğin uçak içine geçmesini önler. Yıldırıma karşı özel tasarlanan, gövdedeki statik elektriğin havaya karışmasını sağlayan donanımlar sayesinde, meydana gelen yıldırım çarpmaları uçağın önemli parçaları için bir tehlikeli durum oluşturmaz.

- *Uçağın havada motoru arızalanırsa ne olur?*

Uçakla yolculuk yaparken hepimizin aklına "uçağın motoru bozulursa ne olur?" sorusu gelmiştir. Hatta hava şartlarının kötü olduğu yolculuklarda bunu daha fazla düşünüyor olabiliriz. Ancak uçağın bir motoru bozulsa dahi sorundan haberdar olmayabiliriz. Çünkü bir motorun durması uçuşu engelleyecek ya da bir kazaya neden olacak büyük bir sorun değildir. Uçağın bir motoru bozulduğunda ya da tamamen durduğunda olacaklardan bahsetmeden önce uçaklarının uçuşunun arkasındaki fiziği anlatmak gerekir. Hepimiz uçakları tek bir uçan birim olarak düşünürüz. Aslında durum bundan farklıdır. Uçaklarda iki temel bileşim uçmayı sağlar: Motorlar ve kanatlar.

Uçak 30.000 feette yoluna devam ederken bir motorunun bozulması herkesin kulağına bir felaket haberi gibi gelebilir. Ancak bu durum kaza demek değildir. Aslında motor arızası nedeniyle gerçekleşen uçak kazalarının oranı sadece 50 milyonda 200'dür. Bunlar oldukça güvenli oranlardır.

Uçak motorları, motor içindeki mekanik problemler, türbin veya panellerdeki hasar, yağ sızıntısı, yakıt kirlenmesi veya motora kuş girmesi gibi nedenlerle durabilir. Bu tür arızalar nadir olmakla beraber başta pilotlar olmak üzere tüm uçuş ekibi bu gibi durumlar için eğitimlidir. Uçaklarda tek bir motorun arızalanması ciddi bir sorun olarak kabul edilmez. Bir motorun arıza yapması bir kazaya neden olmamakla beraber pilotların bazı ayarlamaları yapmaları gereken durumlardır. Bir motorun arızalanması güç ve hızda azalmaya neden olacağı için pilot daha düşük bir irtifayı tercih eder.

Öncelikle bir uçakta aynı anda bütün motorların durması oldukça küçük bir ihtimaldir. Çoğu motor problemi tek bir motorda görülür. Yine de bütün motorlar durursa bu acil bir durumdur. Ama üstesinden gelinebilir. Bir uçağın uçmasına izin veren kuvvetler, uçağın motorları olmadan havada süzülmesine de izin verirler. Motorların çalışmaması ileri itme kuvvetinde eksiklik yaratacağı için irtifa kaybetmek gerekecektir. Ama bu gökten bir taş gibi düşüleceği anlamına gelmiyor. Kanatlar ve dümen ayarlanarak 10 mil ileri gidişte 1 mil irtifa kaybedilir. Yani 30.000 feette bütün motorlar durduğunda 50 mil (yaklaşık 80 km) süzülmek mümkündür.

Uçmak birçok insan için son derece stresli bir deneyim olabilir. Ancak bahsettiğimiz gibi bütün motorların duracağı bir arıza gerçekleştiğinde dahi iyi eğitimli pilotlar ve profesyonel uçuş ekipleri krizi idare edebilirler. Güvenlik protokolleri uygulandığında, irtifa yani yükseklik ve navigasyon ayarları hızlı bir şekilde yapılabilir. Bu şekilde yolcular ulaşmak için yola çıktıkları havalimanı olmasa bile bir uygun havalimanına sağlıklı bir şekilde inebilirler.

- *Uçak havadayken yakıtı biter mi?*

Ülkeler arası veya ülke içinde seyahat eden uçaklardan yakıt sorunu yaşanabilen ve olumsuzlukların ortaya çıkabileceği alanlar daha çok uluslararası anlamda uçuş yapan uçaklardır. Devletlerarası uçuş yapan uçuşların mesafeleri oldukça yüksek olduğu için yakıtın bitme ihtimaline karşı yapılacaklar da belirlenmiştir. Kural olarak uçakların yakıtları gidecekleri yere göre belirlenir. Konacak olan yakıt da kullanılacak olan yakıta göre kat kat fazladır. Bu nedenle de yakıtın bitme olasılığı olağanüstü durumlar dışında olanaksızdır.

APPENDIX H

WRITTEN FORM OF PSYCHOEDUCATION FOR VIRTUAL REALITY THERAPY AND EMDR FLASH TECHNIQUE

Araştırmalar her 100 kişiden 35'inin hayatının bir kısmında uçuş fobisi geliştirdiğini gösteriyor (Foreman & van Gerwen, 2008). Uçuş korkusu klinik araştırmalar sayesinde başedilebilir hale gelmiştir. Artık yalnızca "kendini topla, korkacak birşey yok" demenin sorunla baş etmede etkin bir yöntem olmadığını biliyoruz.

Uçuş korkusuna birçok etken neden olabilir. Mesela:

• Uçuş sırasında yaşanan can sıkıcı bir deneyim, şiddetli bir türbülans veya korkutucu bir yaşantı

• Medyada veya filmlerde yer alan uçak kazası veya haberlerini okuma veya izleme. Bu deneyim sizin veya ailenizden biri için korkutucu olmuş olabilir.

• Gitmek istemediğiniz bir yere uçarken, uçuştan hemen önce veya sonra tatsız bir deneyim yaşama veya yaklaşan bir felaket duygusu yaşama

• Uçmadan önce veya uçuşta panik atak geçirme ve sonrasında kişinin tekrar eden deneyimlerden korkması ve bu nedenle endişeli hissetme beklentisi gibi farklı nedenlerle gelişebilir ve insanların uçmaktan vazgeçmesine veya kaygıyla uçmasına yol açabilir.

Hepsini bir arada değerlendirirsek uçuşla ilgili korkuların iki ana nedeni vardır:

• İlk olarak kişinin uçuşta bir olumsuzluk yaşayacağı ve yardım alamayacağı inancı. Örneğin; panikleme, kontrol kaybetme, dengesizlik, bayılma, kapalı alanda kalma, çıldırma, küçümsenme, sevdiğinden ayrılma, kalp krizi veya beyin kanaması geçirme gibi korkular

• Uçağın düşeceği, kaza olacağı veya uçakta başka kötü bir durumun (havasızlık, türbülans gibi) olacağına yönelik korkular. Örneğin; türbülans, uçak kazası, motor arızası, çarpma, iniş-kalkış gibi durumlarla ilgili korkular

Siz bu gruplardan hangisine ait olduğunuzu düşünüyorsunuz?

Korku durumlarında tehdidin abartılması tipik bir hatadır. Karmaşık ve belirsiz durumlarla karşı karşıya kalındığında kaçmak ve kaçınmak anlık olarak daha iyi hissettirir fakat uzun vadede sorunu daha kronik hale getirecektir.

Uluslararası Hava Taşımacılığı Birliği raporuna göre havayolu en güvenli taşıma aracıdır. Havayolunda 1 milyon uçuş başına tüm kaza oranı 1,35'tir. Bununla birlikte ticari olarak uçan 100 milyon yolcuda yalnızca 1,27 ölüm tespit edilmiştir. En sık kullanılan araçlardan biri olan karayolu taşımacılığına bakıldığında ise dünyada her gün ortalama 3287 kişi trafik kazalarında ölmektedir. Her yıl karayolu kazalarında ölen 1,3 milyon kişiye ek olarak yaklaşık 20-50 milyon kişinin de yaralandığı ve sakatlandığı tahmin edilmektedir. Buna rağmen insanların uçuşun güvenliğiyle ilgili endişe duymaları anlaşılabilir bir durumdur. Çünkü dünyanın herhangi bir yerinde havacılıkla ilgili olan en ufak bir kaza hemen medyada servis edilir ama olaysız normallik haber değeri olmayan günlük 100.000 uçuştan hiç bahsedilmez. Basında aynı haber günlerce yayınlanır çünkü alıştığımızdan farklı bir durumdur.

Havacılıkta bugüne kadarki kazalara bakıldığında kazazedelerin %96'sının sağ olarak kurtulduğu görülüyor. Dünyada her yıl iki milyardan fazla yolcu taşınıyor. Havayolu taşımacılığında yolcuların %99,99'unun güvenli bir şekilde varış noktasında ulaştığı tespit edilmiş. ABD Ulusal Taşımacılık Güvenlik Kurulu raporuna göre dünya çağında on yıldan fazla bir süredir hayatını kaybeden kaza kurbanları, özel yüzme havuzlarında yalnızca 1 yılda meydana gelen ölümcül kazaların sayısına eşit olduğu tespit edilmiştir.

Online Sanal Gerçeklik Terapisi (Online): Uçuş korkusu tedavisinin en iyi yolu bu rahatsızlıklarda etkili olduğu gösterilmiş psikoterapi yöntemlerinin uygulanmasıdır. Uçuş korkusunda en başarılı olduğu gösterilen psikoterapi yöntemlerinin en başında da Bilişsel Davranışçı Terapiye dayanan Sanal Gerçeklik Terapisi gelir. Burada bu terapi yöntemi kullanılacaktır. Bu terapi çok kısaca; korkulan durumlarla sanal ortamda kademeli ve sistematik olarak yüzleşme, alışma ve böylece duygusal tepkinin ortadan kaldırılarak yerine başka bir tepki koyulması gibi yöntemlerle fayda sağlayan bir psikolojik müdahale tekniğidir. Sanal Gerçeklik terapisi; danışanın sanal ortamda uçuş yapmasını sağladığı için ekonomiktir, terapist ile daha kontrollü bir ortam sağlar ve farklı uçuş koşullarını deneyimleme imkanı hazırlar.

Online Emdr Flash Teknik: Bu çalışmada uçuş korkunuz için EMDR Flash Teknik uygulanacaktır. Flash Teknik (FT), travmatik veya diğer rahatsız edici anılarla ilişkili rahatsızlığı azaltmak için yakın zamanda geliştirilmiş bir terapötik müdahaledir. Flash Teknik, Göz Hareketleriyle Duyarsızlaştırma ve Yeniden İşleme (EMDR) terapisinin bir protokolüdür ve danışanın travmatik anıları sıkıntı hissetmeden işlemesine izin verir. Flash teknikte de göz hareketlerini veya bedene çift yönlü uyaran göndermeyi kullanır ve beyindeki işlenmemiş travmatik anıları çözmek için tasarlanmıştır. Bazen on ila on beş dakika gibi kısa bir sürede, şiddetli rahatsız edici anılarla ilişkili rahatsızlık düzeyini azaltmada etkili olduğu gösterilmiştir

- **BİLGİ GÜÇTÜR**

- *Aerodinamikler: Uçak nasıl uçar*

Küçük büyük fark etmeksizin her uçak aynı doğal olaya dayanarak uçar. Kâğıt uçaklar bile aynı fizik kanunlarından faydalanır. Uçma eylemi havanın belirli özelliklerine dayanarak gerçekleşir. Hava ağırlığı olan bir maddedir ve belirli bir yoğunluğu vardır. Hava her yerdedir, bir uçağın asla boşluğa düşme riski yoktur. Bir uçağı havaya almak ve orada tutmak için iki kuvvetin üstesinden gelinmesi gerekir: hız şeklinde itme ve kaldırma.

Başlangıçta pervaneler uçaklara itme sağlamak için kullanıldı, havayı geri itecek ve bu da uçağı ileri doğru itecek şekilde şekillendirilmiştir. Aslında suyu geri iten ve böylece gemiyi geri iten gemi pervanesi de tamamen aynı şekilde çalışır. Bir jet motorunun çalışması, en iyi şişmiş ağzından hava kaçıran bir balon örneğiyle anlaşılabilir. Bir jet motoru da havayı emer, sıkıştırır, yakıtla yakar ve böylece büyük bir basınç oluşturur. Sonuç olarak hava motordan emildiğinden çok daha yüksek bir hızda çıkar. Motor ve onunla birlikte uçak tepki olarak ileri itilir. Ticari havayolu uçakları genelde jet motoruna sahiptir. Bir jet motoru pervaneli motora göre çok daha avantajlıdır çünkü:

• daha basit ve güçlüdür
• daha az hareketli parçadan oluşur
• aşınmaya daha az maruz kalır
• bakımı daha kolaydır
• ve en önemlisi daha güvenlidir.

Bir uçak uçtuğunda, kaldırma özel şekle sahip kanatlar tarafından sağlanır. Bir uçağın kanadının altı düz ve üst kısmı dışa doğru kavislidir. Motorlar uçağa hız verdiğinde hava kanatlarının üstünden geçer. Kanadının üstünden geçen hava alttan geçen havadan daha uzun bir mesafe kat etmek zorundadır. Sonuç olarak, üstten akan hava, aynı zamanda daha büyük mesafeyi kat etmek için daha hızlı hareket eder ve kanadın üstünde, altından daha düşük bir basınca neden olur. Bu düşük basınç, uçağı yukarı doğru çeker veya adeta emer. Aynı doğal olay, bir kâğıt parçasının üst yüzeyinden üfleyerek evde kolayca gösterilebilir: kağıt, üstten akan hava tarafından yukarı doğru çekilir. Bir uçağın kaldırma kuvveti, kanatların şekline ve üzerlerinden geçen havanın hızına bağlıdır. Bunu anlamanın kolay bir yolu, huni havada hareket ederken kanadın üzerindeki havanın bir huninin daha küçük ucuna emildiğini hayal etmektir. Hava huniden çıktığında huninin boyutu daha büyüktür, bu nedenle hava yoğunluğu daha az olur,

- *Uçak ve Teknik*

Uçağın yapıldığı malzeme sağlam olmalı ancak belirli bir esneklik sunmalıdır, çünkü hava her zaman hareket halindedir. Kanatların esnekliği sayesinde havadaki türbülans veya girdaplardan dolayı herhangi bir problem yaşanmaz. Ayrıca, malzeme sıcaklıktaki büyük farklılıklara dayanabilmelidir. Örneğin, uçak sıcak bir ülkede havalanır ve seyir yüksekliğine çıkarsa, sıcaklık + 40° ila -60° Santigrat arasında değişebilir. Bir uçak tasarlanırken tüm bu faktörler dikkate alınır. Bir uçağın kanadı aşağı 8 metre yukarı 8 metre kadar esneyebilir.

Prototip yapıldıktan sonra, normalde uçağın test edilmesi için bir veya iki yıl harcanır. Üretici, ürünün her şekilde tatmin edici olduğuna ikna olana kadar havacılık otoritesine onay için sunulmaz. Ardından makine, tescil edileceği tüm ülkelerdeki tüm havacılık otoriteleri tarafından bir kez daha incelenir ve test edilir. Sadece havayolunun uçuşa elverişliliğinden emin olduğu zaman, uçağa bir tip sertifikası verilir.

- *Temel bilgiler*

Sertifikanın düzenlenmesinden sorumlu kurum ICAO (Uluslararası Sivil Havacılık Kurumu) olup, bundan sonra Türkiye'de SHGM (Sivil Havacılık Otoritesi) bulunmaktadır. Tip sertifikasına ek olarak, belirli tipteki her bir hava aracının,

konuşlanacağı ülkenin havacılık otoritesinden kendi uçuşa elverişlilik sertifikasını alması gerekir. İkinci sertifika yalnızca belirli bir süre için geçerli olduğundan, sertifikasının yenilenmesi için hava aracının düzenli aralıklarla tam denetimden geçmesi ve sertifikalandırılması gerekir.

Uçak sahibi ayrıca uçağın bakım, onarım ve revizyonu ile ilgili yönetmeliklere uymakla yükümlüdür. "Bakım" terimi, uçağı iyi ve uçuşa elverişli durumda tutmak için gerekli olan tüm periyodik faaliyetleri kapsar. Yalnızca kalifiye uzmanlar - özel olarak eğitilmiş mühendisler bakım yapabilir. Ulusal havacılık otoritesi, bakımın doğru ve gerekli zamanlarda yapıldığını kontrol eder. Her uçağın, bakımın doğru zamanlarda yapılıp yapılmadığını kontrol etmek için kullanılan belirli bir bakım programı vardır. Çoğu havayolunun bakım için kullandığı, alfabenin harfleriyle gösterilen beş türü vardır. Her uçuştan sonra yer mühendisleri bir inceleme yapar. Ek olarak, uçuş kaydedici (aslında turuncu-pembe renkli olmasına rağmen genellikle 'kara kutu' olarak bilinir) ve hava veri kaydedicisi uçağa olan her şeyi kaydeder. Örneğin, çok sert bir iniş otomatik olarak kaydedilir; kaptan asla böyle bir olayı örtbas edemez ve uçuştaki her türlü düzensizlik her zaman detaylı şekilde araştırılır.

Günümüzde uçakta, uçağın teknik durumu hakkında düzenli olarak kontroller yapan ve otomatik olarak havalimanına rapor gönderen bilgisayarlar bulunmaktadır (Uçak Haberleşme ve Raporlama Sistemi, ACARS). Herhangi bir şey olması gerektiği gibi olmazsa, uçak B bakımı dediğimiz şey için hangara gider. C bakımı çok daha kapsamlıdır ve uçak tipine bağlı olarak her 300-350 saatlik uçuştan sonra yapılır. D bakımı her 11-12 ayda bir yapılır ve kapsamlı bir incelemeyi içerir. Dört veya beş yıl sonra en büyük bakım görevi olan E bakımı gelir. Örneğin, bir Boeing 747 için bu, bu muayenenin, hangisi önce gerçekleşirse, beş yıl veya 26.000 uçuş saatinden sonra gerçekleştirileceği anlamına gelir. E bakımında yer alan çalışma yaklaşık iki ila üç ay sürer. Tüm uçak parçalara ayrılır; her somun ve cıvata dikkatlice kontrol edilir ve gerekirse değiştirilir. Neredeyse tüm uçak metal yorgunluğu, mikro çatlama ve korozyon açısından kontrol edilir. Kullanılan muayene teknikleri, X-ışını ve gama ışını incelemesini içerir. Daha sonra, uçak mükemmel teknik durumda ve muhtemelen yeni kadar iyi haldedir. Motorlar, iniş takımları ve aletler gibi birçok bileşenin, teknik departman tarafından her uçak için halledilen kendi ek bakım programı vardır.

- *Pilotlar*

Bir kişinin pilot olması için uzun yıllar geçmesi gerekir. Bir havayolu pilotu, uçuş eğitimine genellikle bir uçuş okulunda başlar. Her yıl çok sayıda insan bu kurumlara başvur, ancak yalnızca en iyileri katı seçim prosedürlerini geçmeyi başarır - başvuran her 100 kişiden sadece ikisi kabul edilir. Seçim süreci, kapsamlı bir tıbbi muayene ve psikolojik testler ile yetenek ve motivasyon incelemesini içerir. Bir uçuş okulundaki eğitim yaklaşık iki yıl sürer ve geleceğin pilotları çeşitli uçak türlerini uçurmayı öğrenir. Genellikle iki yıl sonra, en yüksek pilot lisansı olan ATPL (Havayolu Taşımacılığı Pilot Lisansı) sertifikasına sahip olurlar. Bununla birlikte, yeterlilik sertifikası, pilotun herhangi bir uçak tipini uçurmasına izin vermez, sadece testin tamamlandığı belirli bir modele izin verir. Her uçak tipi için farklı bir sınav vardır.

Havacılık okulundan mezun olanlar kendilerine pilot diyebilirler, ancak bu hikâyenin henüz ilk adımıdır. Bundan sonra, pilotların başka bir tıbbi muayeneden geçmeleri ve deneyimlerini gerekli standartta tutmak için yıl boyunca yeterli sayıda saat uçmuş olmaları daha fazla pratik testten geçmeleri gerekir. Her şey yolundaysa, bir yıl yeterlilik sertifikası verilir.

Havacılık okulundan mezun olanlar, bir havayolunun uçuş kadrosuna katılmak için başvurabilirler. Kabul edilirlerse, ilgili şirket tarafından uçulan uçak türü hakkında eğitim almak için doğrudan eğitime geri dönerler. Teoride ustalaştıktan sonra, uçağı bir uçuş simülatöründe (yani pilot için uçak ortamı test edebildikleri sanal gerçeklik sistemine dayanan bir makinede) uçurmayı öğrenirler. Simülatör eğitiminde bir eğitmen eşliğinde dünyanın tüm havaalanlarında tüm hava koşullarında uçuşun çeşitli safhaları teorik ve pratik olarak test edilir. Her şey yolunda giderse pilot eğitime gerçek bir uçakta devam eder. Daha sonra kendi başına uçar, ancak yine de yanında oturan ve yapılan her şeyi dikkatle izleyen bir eğitmenin gözetimindedir. Bu şekilde yeni pilot gözlemci pilot olarak görev yapmaya başlar. Bu pilot iyi uçana kadar eğitmen eşliğinde uçmaya devam eder.

- *Kabin Ekibi*

Kabin ekibi havayolu şirketleri tarafından seçilir ve yetiştirilir. En önemli eğitimlerden biri uçuş güvenliğidir. Havacılık otoritelerine göre kapılar ve acil çıkışların yarısı kapatılsa bile tüm yolcular 90 saniyede uçaktan tahliye edilebilmelidir. Bununla birlikte kabin ekibi ilk yardım eğitimleri gibi birçok eğitim

almaktadırlar. Böylece kalp krizi gibi bir durumda müdahale etmenin yanı sıra bebek bile doğurtabilir. Belirli aralıklarla eğitimleri güncellenir.

- *Hava Trafik Kontrolörleri*

Hava trafik kontrolünün görevi, uçakları tüm dünyadaki rotaları boyunca yönlendirmek ve birbirlerine çok yaklaşmamalarını sağlamaktır. Hava trafik kontrolü, uçağın yeri görmeden bulutta uçmasını da mümkün kılar. Prensip olarak her ülkenin kendi hava trafik kontrolü vardır ve farklı kontrol merkezlerinin tümü birbiriyle iletişim halindedir. Hepsi Uluslararası Sivil Havacılık Organizasyonu tarafından belirlenen kuralları takip eder.

- *Uçaklar arası mesafe*

Uluslararası havaalanları, hava yolları, hava yoluyla on mil genişliğinde ve önceden belirlenmiş bir taban ve tavan yüksekliğine sahip hayali koridorlar ile birbirine bağlıdır. Uçakları havada çarpışmaktan korumak için Trafik Çarpışma ve Önleme Sistemi sistemi geliştirilmiştir. Bu sistem çevredeki uçakların transponder vasıtasıyla sorgulanması esasına göre çalışır ve diğer uçakların transponderlerini sorgulayarak çevreyi tarar ve uçağın verdiği sorgulamaya verilen cevaplar kullanılarak diğer uçakların göreli konumları belirlenir.

- *Türbülans*

Araştırmalar, türbülansın yolcular arasında uçmanın diğer yönlerinden daha fazla korkuya neden olduğunu göstermiştir. Asıl soru, elbette şudur: türbülans tehlikeli mi yoksa sadece rahatsız edici mi? Araştırmalar bize türbülansın bir güvenlik değil konfor sorunu olduğunu gösteriyor.

Uçuş korkusu olan birçok insan türbülanstan da korkar. Orta ila şiddetli türbülansın olduğu bir alanda uçuş sırasında, vücudun alarm zilleri çılgınca çalmaya başlar ve tehlike sinyalleri yanıp sönmeye başlar. Türbülans tehlikeyi çağrıştırır ve korku ortaya çıkar. Türbülans basitçe hareket halindeki havanın neden olduğu uçağın sarsılmasıdır. Hava ceplerinden kaynaklanmaz - aslında, atmosferin hiçbir yerinde vakum veya hava olmayan bir cep diye bir şey yoktur.

Hatırlamakta fayda var. Hava 'hiç' değildir. Hava 'bir şeydir'; meseledir ve parçacıklardan oluşur. Hava bir gazdır ve herhangi bir gazda olduğu gibi, parçacıklar bir sıvıda olduğu gibi hareket eder. Hava, tıpkı su gibi dalgalar halinde hareket eder. İki farklı akım ve dolayısıyla iki farklı dalga hareketi- birbiriyle karşılaştığında, suyun hareketi bozulur ve teknenin sarsıntılı hareketlerine neden olur. Aynı fenomen, farklı hızlara ve dalga hareketlerine sahip iki hava tabakası birbirini geçtiğinde ortaya çıkar. Atmosferimizde düzenli olarak birbirinin yanından geçen iki hava katmanına sahibiz. Biz yükseldikçe rüzgâr güçlenir ve yön değiştirir. Aslında havada uçan bir uçak, suda yüzen bir balığa benzer şekilde hareket eder. Sıcak havanın daha hafif olduğunu ve yükseldiğini, soğuk havanın ise daha yoğun olduğu için düştüğünü, farklı sıcaklıklardaki suda olduğu gibi anlamak önemlidir. Sıcak ve soğuk havanın bu yükselişi ve alçalması atmosferimizde dikey hareketlere neden olur ve doğal olarak uçak bunlara tepki verir.

Türbülans, bir uçağa veya herhangi bir parçasına ne gövdesine, ne kanatlarına, ne de yapısına zarar veremez. Uçaklar, şimdiye kadar gözlemlenen en güçlü türbülansın 2,5 katına dayanacak şekilde tasarlanmıştır. Gevşek nesneler düşüp hasara neden olabileceğinden, uçağın içindeki insanlar için rahatsız edici olabilir. Ama biz kendimiz koltuğumuza bağlandığımızda, aslında uçağa bağlıyız ve bize hiçbir şey olamaz.

- *Uçağa yıldırım çarparsa ne olur?*

Uçuş esnasında uçaklara yıldırım çarpabilir. Yapılan araştırmalara göre her yolcu uçağına yılda ortalama 1 kez yıldırım çarpmaktadır. Uçak, havada yıldırım çarpmasına maruz kalırsa güçlü bir ses eşliğinde parlak ışık ortaya çıkar ve sarsıntılar olabilir. Uçaklar Faraday kafesi konseptine uygun olarak tasarlanır. Yani yolcu uçağına yıldırım düşmesi durumunda yıldırım, uçak içine zarar vermeden havaya karışır. Ayrıca uçak gövdesindeki boya da antistatik özellikli yani elektiriğin birikmesini engelleyen şekilde olur. Bu da elektriğin uçak içine geçmesini önler. Yıldırıma karşı özel tasarlanan, gövdedeki statik elektriğin havaya karışmasını sağlayan donanımlar sayesinde, meydana gelen yıldırım çarpmaları uçağın önemli parçaları için bir tehlikeli durum oluşturmaz.

- *Uçağın havada motoru arızalanırsa ne olur?*

Uçakla yolculuk yaparken hepimizin aklına “uçağın motoru bozulursa ne olur?” sorusu gelmiştir. Hatta hava şartlarının kötü olduğu yolculuklarda bunu daha fazla düşünüyor olabiliriz. Ancak uçağın bir motoru bozulsa dahi sorundan haberdar olmayabiliriz. Çünkü bir motorun durması uçuşu engelleyecek ya da bir kazaya neden olacak büyük bir sorun değildir.

Uçağın bir motoru bozulduğunda ya da tamamen durduğunda olacaklardan bahsetmeden önce uçaklarının uçuşunun arkasındaki fiziği anlatmak gerekir. Hepimiz uçakları tek bir uçan birim olarak düşünürüz. Aslında durum bundan farklıdır. Uçaklarda iki temel bileşim uçmayı sağlar: Motorlar ve kanatlar.

Uçak 30.000 feette yoluna devam ederken bir motorunun bozulması herkesin kulağına bir felaket haberi gibi gelebilir. Ancak bu durum kaza demek değildir. Aslında motor arızası nedeniyle gerçekleşen uçak kazalarının oranı sadece 50 milyonda 200’dür. Bunlar oldukça güvenli oranlardır.

Uçak motorları, motor içindeki mekanik problemler, türbin veya panellerdeki hasar, yağ sızıntısı, yakıt kirlenmesi veya motora kuş girmesi gibi nedenlerle durabilir. Bu tür arızalar nadir olmakla beraber başta pilotlar olmak üzere tüm uçuş ekibi bu gibi durumlar için eğitimlidir. Uçaklarda tek bir motorun arızalanması ciddi bir sorun olarak kabul edilmez. Bir motorun arıza yapması bir kazaya neden olmamakla beraber pilotların bazı ayarlamaları yapmaları gereken durumlardır. Bir motorun arızalanması güç ve hızda azalmaya neden olacağı için pilot daha düşük bir irtifayı tercih eder.

Öncelikle bir uçakta aynı anda bütün motorların durması oldukça küçük bir ihtimaldir. Çoğu motor problemi tek bir motorda görülür. Yine de bütün motorlar durursa bu acil bir durumdur. Ama üstesinden gelinebilir. Bir uçağın uçmasına izin veren kuvvetler, uçağın motorları olmadan havada süzülmesine de izin verirler. Motorların çalışmaması ileri itme kuvvetinde eksiklik yaratacağı için irtifa kaybetmek gerekecektir. Ama bu gökten bir taş gibi düşüleceği anlamına gelmiyor. Kanatlar ve dümen ayarlanarak 10 mil ileri gidişte 1 mil irtifa kaybedilir. Yani 30.000 feette bütün motorlar durduğunda 50 mil (yaklaşık 80 km) süzülmek mümkündür.

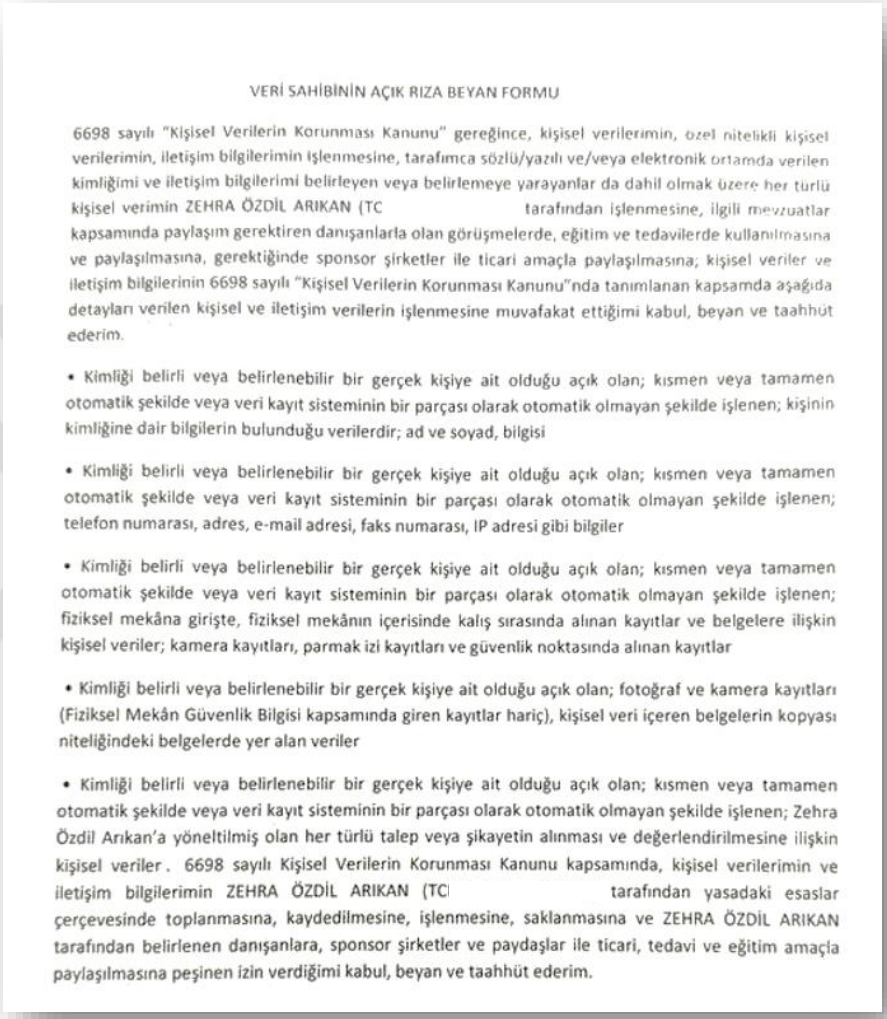
Uçmak birçok insan için son derece stresli bir deneyim olabilir. Ancak bahsettiğimiz gibi bütün motorların duracağı bir arıza gerçekleştiğinde dahi iyi eğitimli pilotlar ve profesyonel uçuş ekipleri krizi idare edebilirler. Güvenlik protokolleri uygulandığında, irtifa yani yükseklik ve navigasyon ayarları hızlı bir şekilde yapılabilir. Bu şekilde yolcular ulaşmak için yola çıktıkları havalimanı olmasa bile bir uygun havalimanına sağlıklı bir şekilde inebilirler.

- *Uçak havadayken yakıtı biter mi?*

Ülkeler arası veya ülke içinde seyahat eden uçaklardan yakıt sorunu yaşanabilen ve olumsuzlukların ortaya çıkabileceği alanlar daha çok uluslararası anlamda uçuş yapan uçaklardır. Devletlerarası uçuş yapan uçuşların mesafeleri oldukça yüksek olduğu için yakıtın bitme ihtimaline karşı yapılacaklar da belirlenmiştir. Kural olarak uçakların yakıtları gidecekleri yere göre belirlenir. Konacak olan yakıt da kullanılacak olan yakıta göre kat kat fazladır. Bu nedenle de yakıtın bitme olasılığı olağanüstü durumlar dışında olanaksızdır.

APPENDIX I

DECLARATION OF AUTHORSHIP BY PROFESSIONALS IN PSYCHO-EDUCATION VIDEO



VERİ SAHİBİNİN AÇIK RIZA BEYAN FORMU

6698 sayılı "Kişisel Verilerin Korunması Kanunu" gereğince, kişisel verilerimin, özel nitelikli kişisel verilerimin, iletişim bilgilerimin işlenmesine, tarafımca sözlü/yazılı ve/veya elektronik ortamda verilen kimliğimi ve iletişim bilgilerimi belirleyen veya belirlemeye yarayanlar da dahil olmak üzere her türlü kişisel verimin ZEHRA ÖZDİL ARIKAN (TC tarafından işlenmesine, ilgili mevzuatlar kapsamında paylaşım gerektiren danışanlarla olan görüşmelerde, eğitim ve tedavilerde kullanılmasına ve paylaşılmasına, gerektiğinde sponsor şirketler ile ticari amaçla paylaşılmasına; kişisel veriler ve iletişim bilgilerinin 6698 sayılı "Kişisel Verilerin Korunması Kanunu"nda tanımlanan kapsamda aşağıda detayları verilen kişisel ve iletişim verilerin işlenmesine muvafakat ettiğimi kabul, beyan ve taahhüt ederim.

• Kimliği belirli veya belirlenebilir bir gerçek kişiye ait olduğu açık olan; kısmen veya tamamen otomatik şekilde veya veri kayıt sisteminin bir parçası olarak otomatik olmayan şekilde işlenen; kişinin kimliğine dair bilgilerin bulunduğu verilerdir; ad ve soyad, bilgisi

• Kimliği belirli veya belirlenebilir bir gerçek kişiye ait olduğu açık olan; kısmen veya tamamen otomatik şekilde veya veri kayıt sisteminin bir parçası olarak otomatik olmayan şekilde işlenen; telefon numarası, adres, e-mail adresi, faks numarası, IP adresi gibi bilgiler

• Kimliği belirli veya belirlenebilir bir gerçek kişiye ait olduğu açık olan; kısmen veya tamamen otomatik şekilde veya veri kayıt sisteminin bir parçası olarak otomatik olmayan şekilde işlenen; fiziksel mekâna girişte, fiziksel mekânın içerisinde kalış sırasında alınan kayıtlar ve belgelere ilişkin kişisel veriler; kamera kayıtları, parmak izi kayıtları ve güvenlik noktasında alınan kayıtlar

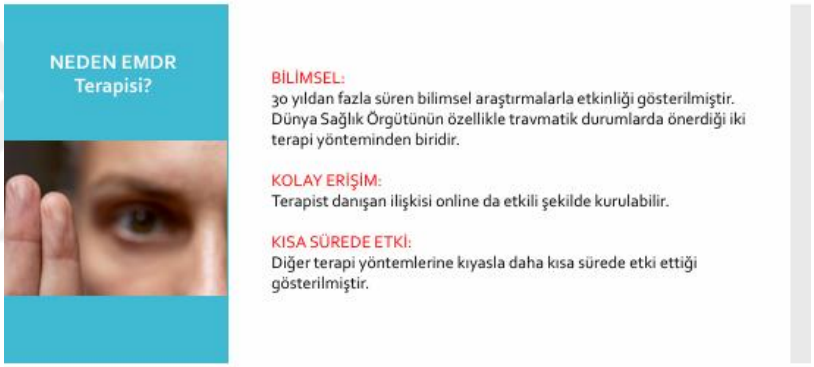
• Kimliği belirli veya belirlenebilir bir gerçek kişiye ait olduğu açık olan; fotoğraf ve kamera kayıtları (Fiziksel Mekân Güvenlik Bilgisi kapsamında giren kayıtlar hariç), kişisel veri içeren belgelerin kopyası niteliğindeki belgelerde yer alan veriler

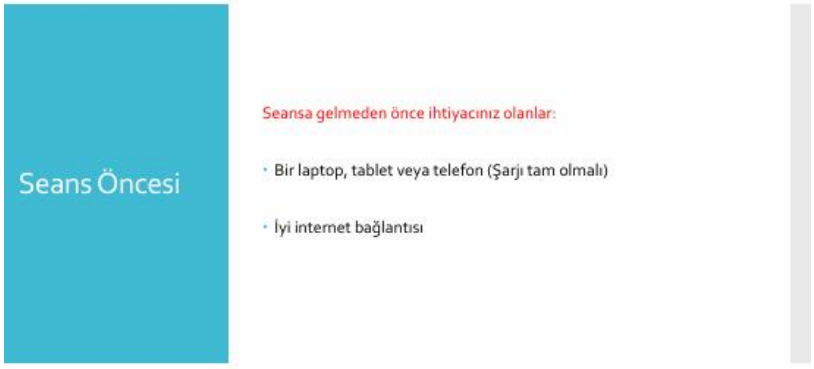
• Kimliği belirli veya belirlenebilir bir gerçek kişiye ait olduğu açık olan; kısmen veya tamamen otomatik şekilde veya veri kayıt sisteminin bir parçası olarak otomatik olmayan şekilde işlenen; Zehra Özdil Arıkan'a yöneltilmiş olan her türlü talep veya şikayetin alınması ve değerlendirilmesine ilişkin kişisel veriler. 6698 sayılı Kişisel Verilerin Korunması Kanunu kapsamında, kişisel verilerimin ve iletişim bilgilerimin ZEHRA ÖZDİL ARIKAN (TC tarafından yasadaki esaslar çerçevesinde toplanmasına, kaydedilmesine, işlenmesine, saklanmasına ve ZEHRA ÖZDİL ARIKAN tarafından belirlenen danışanlara, sponsor şirketler ve paydaşlar ile ticari, tedavi ve eğitim amaçla paylaşılmasına peşinen izin verdiğimi kabul, beyan ve taahhüt ederim.

APPENDIX J

INFORMATIVE FLYERS FOR PARTICIPANTS







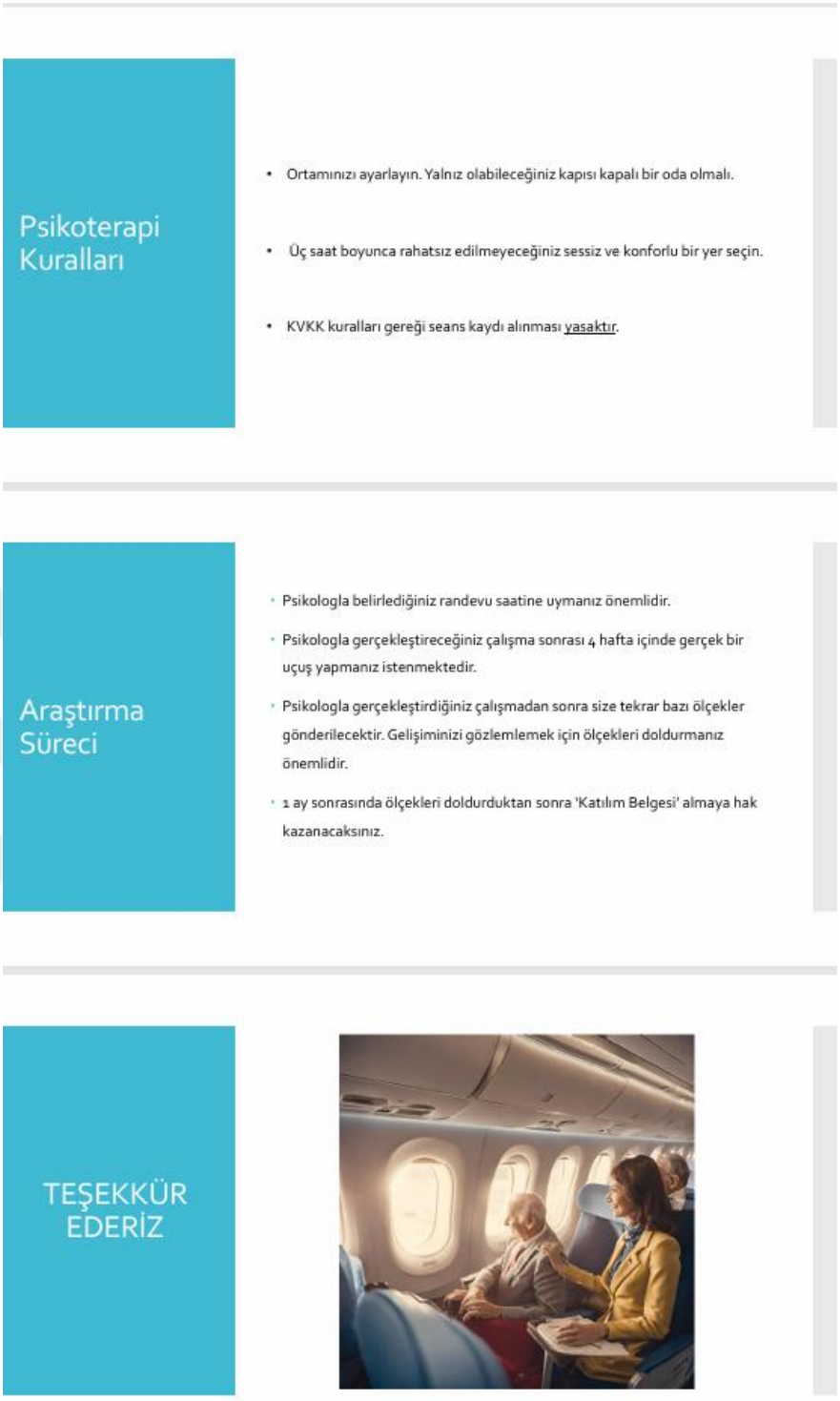


Figure J.1. EMDR Flash Technique Group Flyers

Danışanlar İçin Hızlı Başlangıç

Uzman Psk./Havacılık Psk.
ZEHRA ÖZDİL ARIKAN
Süpervizör: Prof. Dr. Üzeyir Ok
Uçuş Korkusu Doktora Projesi



NEDEN SANAL GERÇEKLİK TERAPİSİ?



BİLİMSEL:
30 yıldan fazla süren bilimsel araştırmalarla etkinliği gösterilmiştir.

KOLAY ERİŞİM:
Akıllı telefonla uzaktan erişilebilir, kolay uygulama özelliği

KONTROLLÜ ORTAM:
Sanal ortamda terapistin kontrolünde bir ortam sunması

Sanal Gerçeklik Terapisi Nedir?

1. XRHealth'ten Amelia nedir?Amelia by XRHealth (Amelia), Ruh Sağlığı Uzmanları tarafından araç olarak kullanılan bir yazılım tıbbi cihazıdır(MHP).
2. Danışanların Sanal gerçeklik (VR) ve 360° simüle edilmiş ortamlara dahil ederek belirli zihinsel sağlık koşullarını iyileştirmek için tasarlanan uzaktan veya yüz yüze terapi seanslarının bir parçasıdır.
3. Amelia'nın klinik ortamlarda veya evde kullanılması amaçlanmıştır.

Seans Öncesi

Seansa gelmeden önce ihtiyacınız olanlar:

- Bir laptop veya tablet
- İyi internet bağlantısı
- Size göndereceğimiz Sanal Gerçeklik Gözlüğü
- Telefon (internet bağlantısı ve şarjı tam olmalı)

GENEL YÖNERGELER:

Oturum Başlatma

1. Akıllı telefon: Hangi cihazı kullanacağınıza önceden karar verin
2. İyi bir Apple veya Android akıllı telefon olabilir
3. Ekran çözünürlüğü iyi bir telefon, dolu bir pil ve güvenilir bir internet bağlantısı gerekiyor
4. İşletim sistemi: Android 7 veya IOS 10 ve üzeri olmalı
5. Minimum depolama alanı kullanılabilirliği: 1 GB. 5GB veya daha fazla depolama alanı
6. VR Gözlüğü: Sanal Gerçeklik gözlüğü size ulaştırılacak. 'Amelia Virtual Care' uygulaması yüklediğiniz telefonunuzu içine koyarak kullanabileceksiniz.

Psikoterapi Kuralları

- Ortamınızı ayarlayın. Yalnız olabileceğiniz kapısı kapalı bir oda olmalı.
- Üç saat boyunca rahatsız edilmeyeceğiniz sessiz ve konforlu bir yer seçin.
- KVKK kuralları gereği seans kaydı alınması yasaktır.

Akıllı Telefon Başlangıç Kılavuzu

Aşağıdaki talimatlar XRHealth Amelia için geçerlidir



Uygulama İndirme

Adım 1. Google'dan Amelia by XRHealth VR (Amelia Virtual Care) uygulamasını indirin.

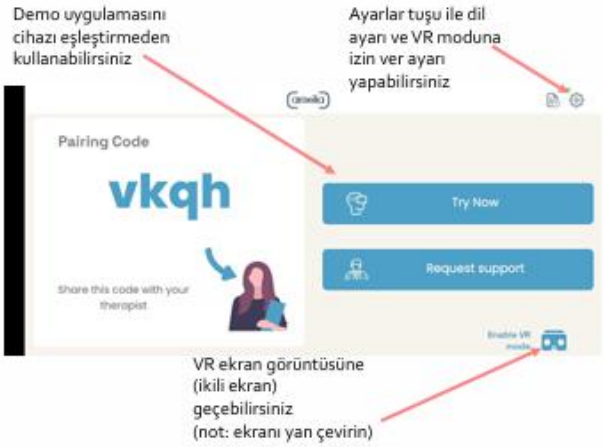
Android için Play Store'dan veya iOS için App Store'dan:

GET IT ON Google Play Download on the App Store

Adım 2. Uygulamaya girin ve gerekli tüm izinleri kabul edin.

Adım 3. Dört karakterli bir kod gördüğünüzde kodu psikoterapistinizle paylaşın. Artık ugulamaya hazırsınız.

Uygulamayı kullanma



2D Modunu Kullanma

- Akıllı telefon uygulamasını ilk açtığınızda otomatik olarak 2D modunda başlayacaktır.
- Çevreyi keşfetmek için beyaz joystick' i parmağınızla ekrana dokunun.
- Psikologunuz rahatsızlık seviyeniz hakkında bilgi isteyebilir. (1'den 10'a kadar bir ölçekte rahatsızlık)
- Basitçe sayıyı seçin, bu sayı rahatsızlık düzeyinizi yansıtır.
- Seçmek için bir numaraya dokunmanız yeterlidir.





VR (Sanal Gerçeklik) moduna izin verme

Uygulama ilk 2D modunda açılır.

Enable VR mode ayarından bu şekilde ekranı cihazla uyumlu hale getirebilirsiniz.

Uyarı: Bu uygulamayı açabilmek için telefonunuzun yeterli hafızası olmalıdır!



VR modundan çıkış yapma

Seansın sonunda 2D moduna dönmek için şu adımları izleyin:

1. Adım. Sol üst köşedeki X tuşuna basın.
2. Adım 2. Mesaj göründüğünde Çıkış'a basın.
3. Lütfen canlı bir oturumdayken VR modundan çıkamayacağınızı unutmayın.
4. Hepsi bu kadar!





Olası Yan Etkiler

Aşağıdaki sağlık belirtilerinden herhangi biri yaşanırsa, kullanım durdurulmalı ve psikoloğa (ve muhtemelen doktorunuza da) bilgi verilmelidir:

- Baş dönmesi
- Değişmiş, bulanık veya çift görme
- Rahatsızlık
- Göz veya kas seğirmeleri
- Farkındalık kaybı
- Oryantasyon bozukluğu
- Panik veya anksiyete atağı
- Aşırı terleme
- Mide bulantısı
- Baş dönmesi
- Nöbetler
- İstemsiz hareket veya kasılma

Olası Yan Etkiler

- VR veya 3D videoların kullanımıyla ilişkili en yaygın olası yan etkiler (baş dönmesi, bulanık görme, göz yorgunluğu, baş ağrıları veya diğer görsel efektler), sinemada 3D film izledikten sonra yaşanabilecek olanlarla aynıdır.
- Bu yan etkiler hafif olma eğilimindedir ve genellikle yaklaşık 15 dakika içinde kaybolur.
- Ancak bazen kalıcı olabilirler ve kullanımdan saatler sonra daha belirgin hale gelebilirler.
- Kullanım sonrası semptomlar, daha önce bahsedilen semptomların yanı sıra aşırı uyuşukluk ve çoklu görev yapma yeteneğinin azalmasını da içerebilir.
- Danışanda bu semptomlardan herhangi biri ortaya çıkarsa ekipmanı kullanmayı bırakın ve dinlenin.

VR kullanılmayan durumlar

Aşağıdaki özel durumu olan danışanlarda Sanal Gerçeklik Terapisi kullanılmamalıdır:

- Alkol gibi maddelerin etkisi altında yorgunluk veya bitkinlik yaşıyorsanız
- Uyuşturucu kullanıyorsanız
- Akşamdan kalmaysanız
- Sindirim sıkıntınız varsa
- Soğuk algınlığı, grip, baş ağrısı, migren, baş dönmesi ya da kulak ağrılarınız varsa
- Hamileyseniz veya hamile olma ihtimaliniz varsa
- Fiziksel, zihinsel, görsel veya kalp sorunlarınız varsa,
- Kalp pili veya başka bir implant cihazı, holter gibi
- Sizi nöbet geçirmeye yatkın hale getirebilecek nörolojik durumlar varsa

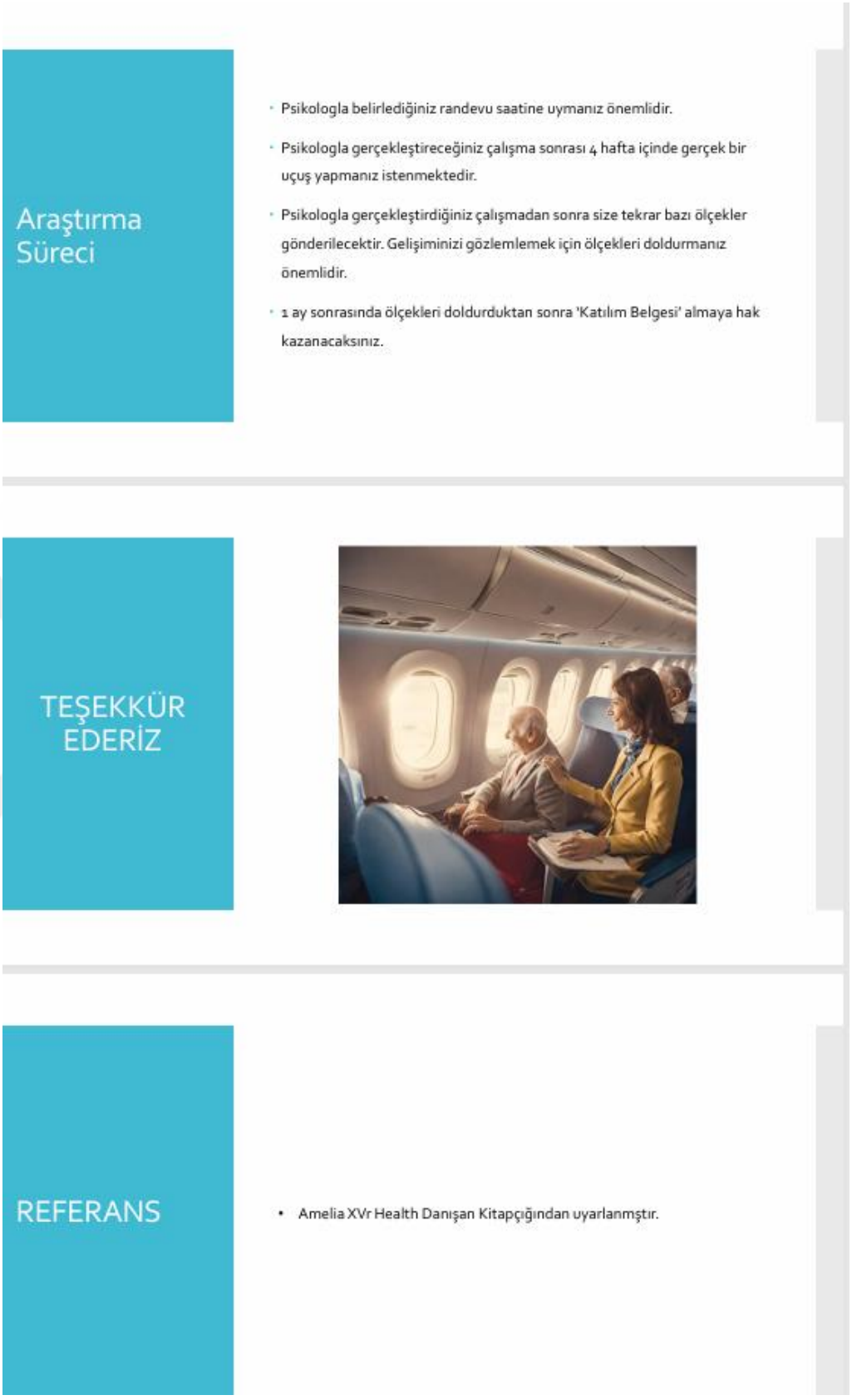


Figure J.2. OVRET Group Flyers

APPENDIX K

ANNOUNCEMENT OF PROJECT VIA SOCIAL MEDIA



Figure K.1. Announcement Post for Social Media

APPENDIX L

CERTIFICATE OF APPRECIATION FOR PSYCHOTHERAPISTS



APPENDIX M

CERTIFICATE OF APPRECIATION FOR EXPERTS WHO CONTRIBUTED TO PSYCHO-EDUCATION VIDEO



APPENDIX N

ETHICS COMMITTEE PERMISSION

Evrak Tarih ve Sayısı: 01.03.2022-11584

İBN HALDUN ÜNİVERSİTESİ

T.C.
İBN HALDUN ÜNİVERSİTESİ
Sosyal ve Beşeri Bilimler Bilimsel Araştırma ve Yayın Etiği
Kurulu Başkanlığı

Sayı : E-71395021-020-11584 01.03.2022
Konu : Zehra ÖZDİL ARIKAN-Etik Kurul Kararı

İLGİLİ MAKAMA

Kurulumuza başvuran Zehra ÖZDİL ARIKAN'ın "Sanal Gerçeklik Terapisi ve EMDR Flash Terapinin Online Versiyonlarının Uçuş Korkusu Tedavisi Üzerindeki Etkileri İçin Rastgele Kontrollü Bir Deneme Tasarımı" isimli projesi; amaç, araştırma türü, veri toplama araçları, süreç ve işlemler, veri analizleri dikkate alınmak suretiyle 16.02.2022 tarihinde değerlendirilerek 2022/02-3 karar numarası ile etik açıdan uygun bulunmuştur.

Bilgilerinizi arz/rica ederim.

Prof. Dr. Alev ERKİLET
Başkan

Bu belge, güvenli elektronik imza ile imzalanmıştır.

Belge Doğrulama Kodu :BSU8A3NA4 Belge Doğrulama Adresi: https://www.turkiye.gov.tr/ibn-haldun-universitesi-ebys

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CURRICULUM VITAE

Full Name:
Zehra Özdil Arıkan

Education

Doctorate:

2018-2025	Ibn Haldun University, Social Sciences Faculty, Clinical Psychology Department Doctoral dissertation: "Online Versions of Virtual Reality (VR) Therapy and EMDR Flash Therapy on the Treatment of Flying Fear"

Graduate Degree:

September 2009-2010	Kingston University, Faculty of Arts and Social Sciences, MSc Applied Child Psychology Master's thesis: "The Effect of vicarious learning and preparedness on fear acquisition in childhood"

Undergraduate Degree:

2004-2009	Istanbul Bilgi University, Faculty of Arts and Sciences, Department of Psychology

Work Experience:

Feb 2010-	Turkish Airlines Health Department, Aviation Psychologist

Conferences and Symposiums:

December 7-8 2024	6th Aviation and Space Psychology Congress, Istanbul

September 23-26 2024	35th EAAP (European Association for Aviation Psychology) Aviation Psychology and Applied Human Factors Congress, Athens
June 6-7 2024	7th Ibn Haldun University Gradcon Conference, Istanbul
5-6-7 2023	2. National EMDR Congress, Istanbul
Apr 16-17 2023	Virtual EMDR Early Intervention Conference for Turkey, Syria, Ukraine, Lebanon & Pakistan
Oct 26-29 2022	33. EAAP Aviation Psychology Congress-Gibraltar
May 9-10 2021	1.National EMDR Congress, Istanbul
Mar 21-30 2021	International Trauma Symposium
Dec 5-6 2020	National Aviation Psychology Symposium, Istanbul
Nov 21-22 2021	PEGDER Psychotherapy Case Study Symposium
Jul 10-12 2020	2 th Annual Muslim Mental Health Conference (USA)
Oct 26-28 2018	4. National Aviation and Space Medicine Congress, Civil Aviation Authority of Turkey, Istanbul/Türkiye
Sep 26-30 2016	32. EAAP (European Association for Aviation Psychology) Aviation Psychology Congress, Thinking High and Low Cognition and Decision Making in Aviation, Cascais /Portugal
Nov 12-13 2013	DLR-PROFA Congress, Hamburg /Germany
24-28 Sep 2012	30th EAAP Conference, Aviation Psychology and Applied Human Factors - Working towards zero Accidents. With a special Session on Aviation Economics.
3-7 July 2011	5. International Aviation Psychology Summer School, Graz, Austria
2-5 May 2011	16. International Aviation Psychology Symposium, Wright State University, Dayton, Ohio, USA
16-17 October 2008	3rd Symposium of Psychological Consulting and Guiding in Universities, Intervention of Trauma and Crises, Istanbul Bilgi University, Istanbul
30 April-3 May 2008	18th World Congress of the International Association for Child and Adolescent Psychiatry and Allied Professions (IACAPAP 2008), Istanbul

28-30 April 2008	18th National Child and Adolescent Mental Health and Disease Congress, Istanbul
5-8 July 2007	12th Congress of National Psychology Students which its subject is 'Life Under Risk'. Near East University, North Cyprus

Publications:

1. Özdil Arıkan, Z., Yıldız, B. (2025). Post-earthquake psychosocial support interventions implemented by an airline company. *Human Factors in Aviation and Aerospace, 2(2),* 113-125. https:77doi.org/10.26650/hfaa.2025.1760438

2. Kurtuluş, D., & Arıkan, Z. Ö. (2025). The impact of adverse childhood experiences on the clinical and psychological characteristics of fibromyalgia patients. *Medical Journal of İzmir Hospital, 29*(2), 137-143.

3. Kurtuluş, D., Dağcı, S., Suçeken, F. Y., & Arıkan, Z. Ö. (2025). Psychiatric Comorbidity and Overactive Bladder in Fibromyalgia: A Cross-sectional Analysis. *Grand Journal of Urology*, *5*(3).

4. Özdil Arıkan, Z. (2025). The Role of Online Virtual Reality Therapy: New Approaches in Treatment of Aviophobia. *Human Factors in Aviation and Aerospace*, *2*(1), 57-69.

5. Ozdil Arikan, Z., Ok, U. (2024). The effect of a single-session online virtual reality therapy program on fear of flying: The results of a pilot study (in press)

6. Ozdil Arikan, Z., Yildiz, B., Aybey D. (2024). Perspective of an Airline Company: Post-Disaster Psychosocial Support After The Kahramanmaras/Turkiye Earthquake (in press)

7. Askew, C., Dunne, G., Özdil, Z., Reynolds, G., & Field, A. P. (2013). Stimulus fear-relevance and the vicarious learning pathway to childhood fears. Emotion, 13(5), 915-925. http://dx.doi.org/10.1037/a0032714

8. Ozdil Arikan, Z., Ertemir, D., & Keskinkilic, C. (2018). A Norm Study of a Neuropsychological Test Battery for Evaluating Cognitive Functions in Commercial

Airline Pilots. *Dusunen Adam the Journal of Psychiatry and Neurological Sciences, 31*, 375-388. DOI:10.5350/DAJPN2018310406