

Case Study

## Application of Virtual Reality Exposure Therapy on Management of Astraphobia: A Single Case Study

Bhagyashree Kar<sup>1\*</sup>, Dr. Pratiti Pattnaik<sup>2</sup>, Dr. Jashobanta Mahapatra<sup>3</sup>

### ABSTRACT

**Background:** The abnormal fear of thunder and lightning termed as astraphobia (ICD-10: F40.2) is a type of specific phobia in which an individual reflects fearful behaviour as well as physical symptoms with an underlying psychological conflict. Virtual reality exposure therapy (VRET) is an increasingly common treatment for anxiety and specific phobias. Virtual Reality Exposure Therapy help to improve prolonged exposure because it creates fictitious, safe, and controllable situations that can enhance emotional engagement and acceptance.

**Keywords:** *Astraphobia, Virtual reality exposure therapy*

Astraphobia is a type of specific phobia (ICD-10: F40.2) in which there is an abnormal fear of thunder and lightning is reported by the individual concern. The term astraphobia is derived from the Greek words 'astrape' which stands for 'lightning' and 'phobos' means fear. Astraphobia is also known as, Brontophobia, Astrapophobia, Keraunophobia, Ceraunophobia, or Tonitrophobia. The person suffering from astraphobia reflects fearful behaviour as well as physical symptoms with an underlying psychological conflict.

Virtual reality exposure therapy is a psychological treatment that was developed to help people confront their fears. In this form of therapy a therapist create a safe virtual environment in which to "expose" an individual to the things he/she fear and avoid. The exposure to the feared objects, activities, or situations in a safe environment helps reduce fear and decrease avoidance.

<sup>1</sup> Ph. D. Scholar, Dept. of Clinical Psychology, RINPAS, Kanke, Ranchi, India

<sup>2</sup> Assistant Professor, Department of Clinical Psychology, MHI, SCB medical College, Cuttack, Odisha, India

<sup>3</sup> Associate Professor & Head of Department of Clinical Psychology, MHI, SCB medical College, Cuttack, Odisha, India

[\\*Responding Author](#)

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## **CASE HISTORY**

The index patient was a 42 years old, female, educated up to 8<sup>th</sup> standard, married, Hindu, Odia speaking, housewife, belonging to middle socio-economic status, hailing from rural area of Sindbali, Nuapada district, Odisha.

She was brought by her elder son and husband to dept. of clinical psychology M.H.I, SCB OPD on 10.05.2016 with the Complaints of Fear of Thunder and Lighting since last two years.

The patient was apparently alright and maintaining well 2 years back. Once during rain thunder and lightning caused damage to all the electrical household items in patient's home. She later on gets to know about few incidences of death and injury occurred in different locations of the locality she was residing due to lightning in that rain episode. At that time the patient shocked severely, resulting in development of fear of thunder, lightning and even sight of black clouds in the sky. Sometimes even the weather forecast of rain is enough to evoke fear in the patient.

There was no history suggestive of any psychiatric or neurological disorders. Furthermore there was no history suggestive of any kind of substance intake, significant head injury, high fever, acts of self-harm or suicide, fear of open or closed places, fear of high places, fear of animal/s. Pt lives with her husband and 3 children (two sons and one daughter). Relationship between family members is cordial. Family members are supportive towards the patient. No history suggestive of drug abuse/suicide in the patient family. There is no history of mental illness present in the family.

### ***Procedure***

After having the informed consent for therapeutic intervention rapport was established with the patient. She was informed about the intervention procedure. Thereafter 16 therapeutic sessions of weekly twice for about 45-60 minutes duration were conducted. The socio-demographic details such as age, gender, religion, family structure, etc were gathered with the help of a self prepared semi-structured socio-demographic datasheet. After that the pre-intervention assessment was done by using the HAM-A, HAM-D and PGI General Well-being Measures. After that structured sessions of psycho-education, motivational counselling, cognitive restructuring and virtual reality exposure therapy was applied. Then after the Post-intervention assessment was done by using the same assessment measures which were used for the pre-intervention assessment.

The patient was asked to make a fear hierarchy in which she was asked to write down the feared objects or situations and rate them in percentage starting from 0 to 100. In other words, she was asked to rate 0% to the object/s which did not produce any fear response and 100% to the object/s which produced the most fear responses. In this process of hierarchy making

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the therapist also helped the patient to make a proper hierarchy which was again evaluated after the intervention.

### *Therapeutic Intervention in Details*

After the structured clinical interview and assessment a total of sixteen structured therapeutic sessions were conducted including psycho-education, motivational counselling, cognitive restructuring along with virtual reality exposure therapy.

Following is the session wise detailed discussion of the total therapeutic intervention plan:

**Session 1:** The initial session focused on developing psychological understanding of symptoms to the patient as well as to her family members. They were informed about the problem, its mode of onset, course, progress and prognosis. Also possible reasons behind her problem were discussed to develop insight about illness. Family members were also informed about their role in the therapy and the ways they reinforce her behavior. The use and the importance of therapy were also discussed along with its mode of actions. The patient was motivated to be regular in between the sessions and also to follow the instructions given to her.

**Session 2:** In this session the patient was explained about the role of healthy cognitions in maintaining healthy emotions and healthy behaviors. The therapist explained how the patient has perceiving a particular situation in a catastrophic as well as negative manner. She was explained that how her fear is correlated to her dysfunctional thinking not with the external situation such as rain, thunder, lightning and so on.

**Session 3, 4, 5 and 6:** With the help of a computer and a projector the therapist created a virtual world of sky where the patient was exposed to her fears gradually in the presence of the therapist. The patient was exposed to still pictures of gray clouds, black clouds followed by still pictures of lightning. At first the patient reported of much anxiety which was also evident from her behaviors (sweating, standing, crying and so on). The anxiety rating at the beginning of the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> sessions was 100%, 98%, 86% and 70%. She reported decrease in her anxiety level gradually. Then subsequently the patient with the help of the therapist progress towards the next sessions of the therapeutic intervention. Different pictures were used in each presentation to avoid habituation.

**Session 7, 8 and 9:** After the presentation of still pictures the therapist introduced silent moving pictures. Grey clouds which were gradually turning black as well as pictures of lightning were shown to the patient. This presentation evoked great anxiety at first but latter on the anxiety was decreased as reported by the patient herself. To avoid habituation here also different pictures were used in each session.

**Session 10, 11, and 12:** There after sound was incorporated with the presentation of still pictures such as sound of wind with clouds and sound of thunder with lightning.

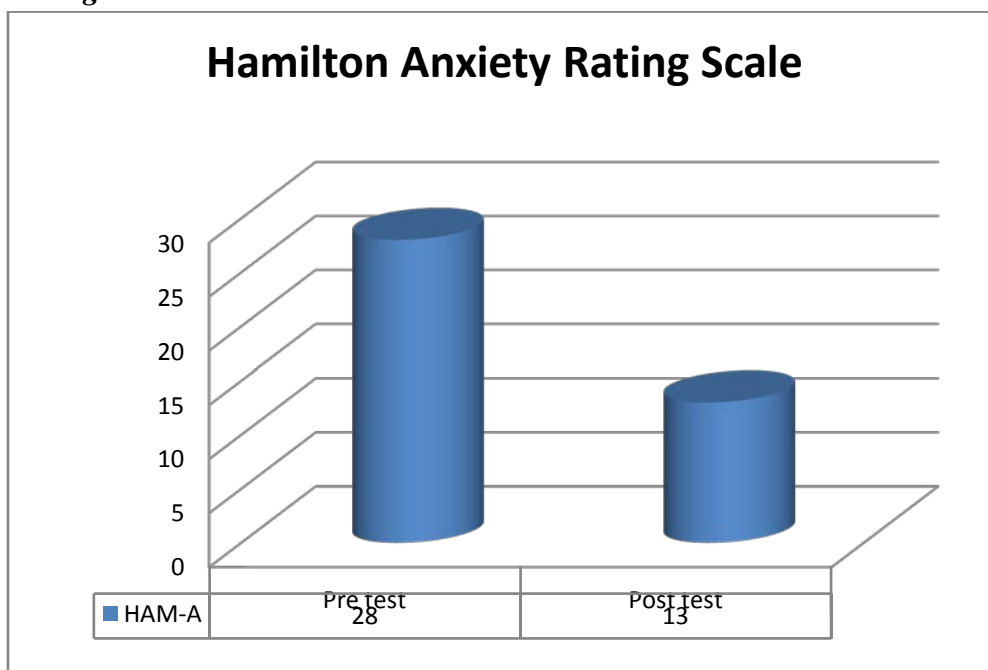
**Session 13, 14 and 15:** Videos of thunder storm was presented in these sessions. These videos shows the moving grey clouds turning black and gradually lightning, thunder with heavy rain.

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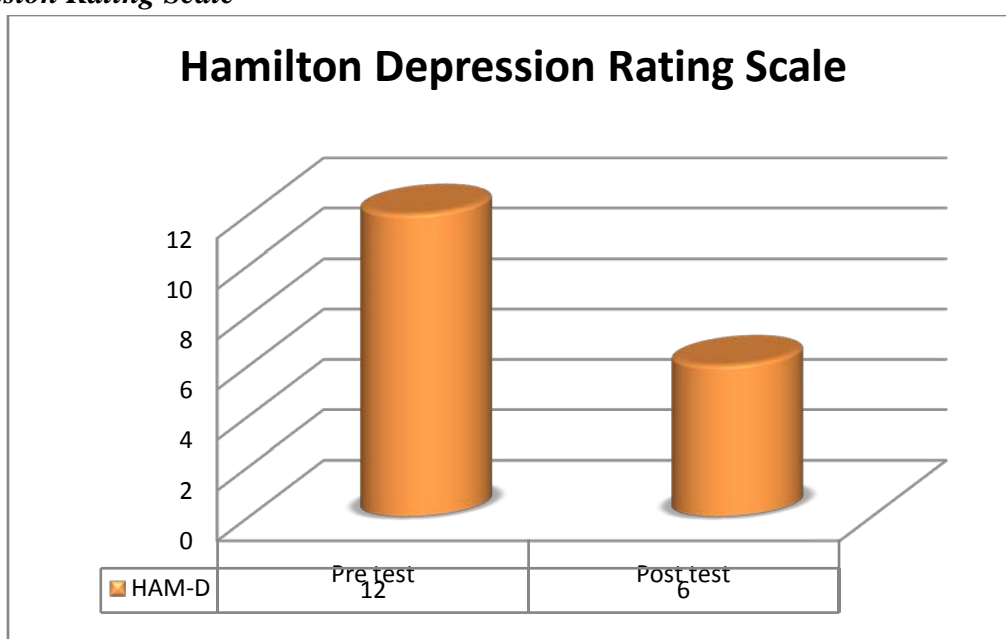
**Session 16:** The Termination phase focused on the identification of defence mechanism and self disclosure. In the process of self disclosure the patient was able to identify her conflict areas. She developed a better understanding to minimize aforesaid conflicts. After that post therapeutic assessment was done.

### RESULT AND DISCUSSION

*Figure 1: Graphical Representation of Pre and Post Intervention Assessment on Hamilton Anxiety Rating Scale*



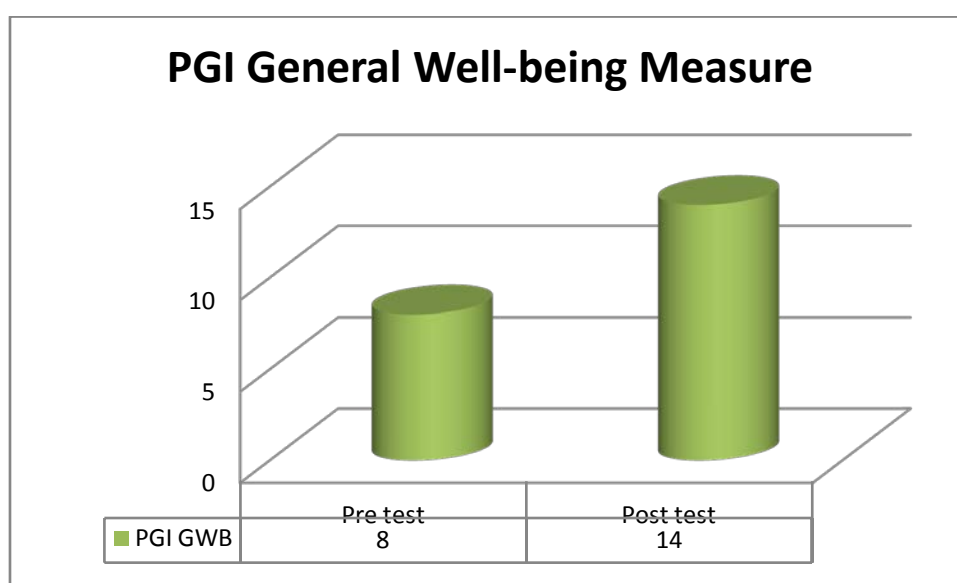
*Figure 2: Graphical Representation of Pre and Post Intervention Assessment on Hamilton Depression Rating Scale*



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**Figure 1 & 2:** The results of the present study demonstrate that there is a significant difference on the obtained scores between the pre and post intervention assessments of the patient on Hamilton Anxiety Rating Scale and Hamilton Depression Rating Scale. Thus it can be suggested that the virtual reality therapy is effective in reducing the symptoms of anxiety as well as depression. The obtained findings of the present study are supported by the study conducted by Muhlberger, et al, (2001) and Garcia-Palacios et al., (2002). Harris et al., (2002), Rothbaum, et al, (2006), Klinger et al., (2005) have also observed improvement in reducing the symptoms of anxiety symptoms of fear, dry mouth, sweating, palpitation as well as depressive symptoms of hopelessness, pessimism, irritability and sleep related problem after intervention.

**Figure 3: Graphical Representation of Pre and Post Intervention Assessment on PGI General Well-being Measure**



**Figure 3:** The result show that the present study demonstrates that there is a significant difference in the scores on PGI General Well-being between the pre and post intervention assessments. It suggests that virtual reality therapy is effective for improvement in general well being. The present study indicates that client exhibited improvement at post intervention assessment and had improve well-being. They above finding also suggest by William, et al, (2011) and Powers, et al, (2008). Harris et al., (2002), Krijn, et al., (2004), and Maltby et al., (2002) Their study demonstrated significant improvement by the end of treatment which was evident by a reduction in symptom of anxiety and improvement her general well-being after the application of virtual reality therapy.

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**Table 1: Comparison between the Pre and Post Intervention Fear Hierarchy as Stated by Patient**

Sl. No.	Stimuli	Fear Percentage at Pre Intervention (%)	Fear Percentage at Post Intervention (%)
1	White Clouds	0	0
2	White clouds moving	10	0
3	Weather Forecast of Rain by news channels	20	0
4	People around talking about the aforesaid forecast	30	0
5	People talking about the previous years damages due to wind, rain, lightning	35	5
6	Slow wind movement	40	0
7	Slow movement of clouds	40	0
8	Increased movement in clouds	50	0
9	Clouds turning grey colour	80	0
10	Grey clouds moving	85	5
11	Rainy weather	90	10
12	Grey clouds turning black	90	10
13	Black clouds moving	90	10
14	Lightning	100	30
15	Thunder	100	30

**Table 1:** The results of the present study demonstrate a significant difference in the percentage scores of fear between pre and post intervention levels. At the post intervention level, decline in the fear behaviour of the patient was reported. The present study findings are also supported by the studies conducted by Rothbaum, et al, (2000) and Biemond, et al, (2004). They have also supported by Emmelkamp et al., (2002), Parsons, et al, (2008).

## CONCLUSION

Virtual Reality Exposure Therapy is an exceptional technique of Cognitive Behaviour Therapy. It is not only about using a purely cognitive approach, but about exposing their clients to their worst fears, in the hope that they will learn skills that they will use in the real world when confronted by those fears. Thus the study concludes that once the individual learn to control her irrational fear her psychological well-being flourished.

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**Conflict of Interests:** The author declared no conflict of interests.

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