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"AN INTERVENTIONAL STUDY ON EFFECT OF ASHWAGANDHA ON ATYPICAL EATING DISORDER (OSFED) IN EXAM ATTENDING STUDENTS WITH SPECIAL REFERENCE TO CHITTODVEGA"

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ABSTRACT

Background: Atypical eating disorders are defined as disordered eating patterns that do not meet the criteria for particular disorders such as anorexia or bulimia but still have a substantial impact on an individual's relationship with food, body image, and mental well-being. It refers to a wide range of disordered eating behaviours and attitudes that may not meet standard diagnostic criteria but can nevertheless have substantial medical and psychological implications. **Objectives of the study:** Compiling and analysing classical as well as modern reference about OSFED with eating disorders with special reference to *chittodvega*. To evaluate the effect of *Ashwagandha churna* (capsules) in management of atypical eating disorder in exam attending students with respect to *chittodvega*. To access the quality of life in students group after medication. **Methodology:** Interventional non-randomized open labelled single group study with pre-test and post-test design. A minimum of 20 exam attending students diagnosed with atypical eating disorder and anxiety are selected from Sri Dharmasthala Manjunatheshwara Ayurveda Hospital, Kuthpady, Udupi (SDMCAU), hostel and near locality. Recruited subjects were treated with oral administration of Ashwagandha churna (capsules) 2 capsules twice a day after food. This medication is continued for 4 weeks. Assessment of frequency of eating and anxiety are assessed with self prepared validated scale and Hamilton anxiety rating scale before and after treatment on zeroth, 28th, and 56th, day and statistical analysing before and treatment is done by using paired t test and Wilcoxon signed –rank test. **Results:** The study showed remarkable and statistically significant results. **Conclusion:** Study showed had a positive outcome and can be recommended in patients suffering from chittodvega.

Keywords: OSFED, *Chittodvega*, *Ashwagandha*, Hamilton-anxiety rating scale, WHO-quality of life rating scale, Atypical eating disorder.

INTRODUCTION

Atypical eating disorders, also known as Other Specified Feeding or Eating Disorders (OSFED)[1], are a type of disordered eating behaviour that does not meet the criteria for anorexia nervosa, bulimia nervosa, or binge-eating disorder but still has a significant impact on an individual's physical and mental well-being. OSFED is a complex and difficult disorder to diagnose and treat since it involves a wide variety of irregular eating patterns. Various symptoms and behaviours demonstrated by affected people is one of the fundamental hallmarks of atypical eating disorders. Atypical anorexia nervosa, in which individuals restrict their food intake and exhibit great anxiety of gaining weight but do not fulfil the low body weight criteria for a formal anorexia nervosa diagnosis, is a prevalent variant of OSFED. Another subtype is bulimia nervosa of limited frequency and/or duration, which is characterised by binge eating episodes followed by inappropriate compensatory behaviours and occurs less frequently than the diagnostic criteria for bulimia nervosa. OSFED also includes night eating syndrome, purging disorder, and other specific feeding or eating disorders, demonstrating the variety of ways in which disordered eating can present but does not match the criteria of any specified eating disorders. Atypical[2] eating disorders can affect people of diverse ages, genders, and socioeconomic backgrounds. They are frequently the result of a confluence of genetic, psychological, environmental, and societal variables. These illnesses can be caused by genetic predisposition, personality features, and neurological causes. Furthermore, societal pressures, media impact, and cultural views towards body image and beauty standards can amplify feelings of inadequacy and contribute to the emergence of disordered eating behaviours.

Objectives

- Compiling and analysing classical as well as modern reference about OSFED with eating disorders with special reference to *chittodvega*[3].
- To evaluate the effect of *Ashwagandha*[4] churna (capsules) in management of atypical eating disorder in exam attending students with respect to *chittodvega*.
- To access the quality of life in students group after medication.

Materials and methods

Exam attending students diagnosed with atypical eating disorder and anxiety are selected from SDMCAU, hostel and near locality.

Study design

Open labelled non-randomized clinical study with pre-test and post-test design where in minimum of 20 participants were selected, the parameters were analysed statistically.

Intervention

Selected subjects were administered with *Ashwagandha churna* 2 capsules twice daily after food. This medication will be continued for 4 weeks

Duration of Clinical Study:

Intervention : 4 weeks

Follow up : 4 weeks after the study.

Total duration : 8 weeks

Diagnostic criteria

1.Diagnosed case of OSFED of DSM-5.

2.Increased /decreased frequency of eating.

3.Change in weight during one month.

4.Diagnosed cases of anxiety.

Inclusion criteria:

1.Cases full fills diagnostic criteria.

2.Age group between 18-30 of either sex.

3.Students who have exam within 60 days.

Exclusion criteria:

1.Patients diagnosed as Anorexia Nervosa, Bulimia Nervosa, and Binge eating.

2.Patients of other psychological disorders.

3.Eating disorder in the subjects who are not facing the exam within 60 day

Assessment criteria:

- Assessment of frequency of eating and anxiety are assessed with self prepared validated scale and Hamilton anxiety rating scale[5] before and after the treatment on zeroth, 28th, and 56th day and statistical analyzing before and after treatment will be done by using paired t test and Wilcoxon signed – rank test.

Subjective criteria:

- Increased /decreased frequency of eating[6].
- Psychological variations.
- Preoccupation with food and eating.
- Heightened anxiety and/or irritability around mealtimes.
- Depression, anxiety, or irritability.
- Low self-esteem and feelings of shame, self-loathing, or guilt
- 'Black and white' thinking[7]- rigid thoughts about food being 'good' or 'bad.

STATISTICAL ANALYSIS

Statistical analysis was done by comparing the scores before and after intervention within the group by using Wilcoxon signed rank test.

RESULTS

The study was carried out on 20 subjects for the total duration of 30 days by administering the *Ashwagandha* capsule, the dose was 2 capsule twice daily after food. Results of the same was estimated on different rating scale scores and objective criteria

PATTERN OF INVOLVEMENT IN STUDY- BT & AT

The effect of Ashwagandha on pattern of involvement in study before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 39.44 before treatment was increased to 42.22 after treatment, but since the P value is not less than 0.05, It shows that it is not statistically significant to prove the efficacy of the treatment. Further research should be carried out on a large sample to prove it statistically. Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 1: Involvement Pattern Of Study

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
39.44	42.22	2.78	7.04 %	BT-10.94	BT-4.580	BT-40	1.602	0.129
				AT-11.35	AT-3.202	AT-42		

IRREGULARITY IN EATING PATTERN – BT & AT

The effect of *Ashwagandha* on irregularity in eating pattern before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 5.667 before treatment was reduced to 3.167 after treatment, since the P value is less than 0.05, shows that treatment is statistically significant. Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 2: Irregularity in eating pattern

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
5.667	3.167	2.5	44.11%	BT-2.066	BT-0.843	BT-6.000	-2.54	0.007
				AT-1.602	AT-0.654	AT-2.500		

EFFECTIVENESS OF METHODS IN COMBATTING EXAM STRESS BT & AT

The effect of *Ashwagandha* on irregularity in eating pattern before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 45.00 before treatment was increased to 53.750 after treatment, since the P value is less than 0.05, shows that treatment is statistically significant. Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 3: Involvement in combatting Exam stress

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
45.000	53.750	8.75	19.44%	BT-8.869	BT-4.435	BT-44.000	-3.09	**0.0008**
				AT-8.539	AT-4.270	AT-52.500		

Effect of treatment on Hamilton's Anxiety Rating Scale (HAM-A) BT & AT

The effect of *Ashwagandha* on Hamilton Anxiety rating scale (HAM-A) before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score of HAM-A is 26.600 before treatment was reduced to 16.450 after treatment, shows that treatment is statistically significant (P<0.001). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 4: HAM-A BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
26.600	16.450	10.15	52.5%	BT-5.641	BT-1.255	BT-27.00	1.976	<0.050
				AT-4.383	AT-0.980	AT-17.500		

Effect of treatment on QOL-WHO (QUALITY OF LIFE RATING SCALE) BT & AT

The effect of *Ashwagandha rasayana* on Hamilton Anxiety rating scale (HAM-A) before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score of QOL-WHO Rating Scale is 18.550 before treatment was reduced to 13.000 after treatment, shows that treatment is statistically significant (P<0.001). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 5: QOL-WHO BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
18.55	13.00	-5.55	27.75%	BT-3.531	BT-0.790	BT-11.500	-3.942	<0.001
				AT-	AT-	AT-18.500	-3.942	<0.001

Effect of treatment on change in eating pattern BT & AT

The effect of *Ashwagandha* on change in eating pattern before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 1.00 before treatment was reduced to 0.500 after treatment, shows that treatment is statistically significant (P=0.002). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 6: Change In Eating Pattern BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
1.00	0.500	-0.5	2.5%	BT-0.000	BT-0.000	BT-0.500	-3.162	0.002
				AT-0.513	AT-0.115	AT-1.000		

EFFECT OF TREATMENT ON CHANGE IN STRESS BT & AT

The effect of Ashwagandha rasayana on change in eating pattern before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 1.000 before treatment was reduced to 0.600 after treatment, shows that treatment is statistically significant (P=0.008). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 7: Change In Stress BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
1.000	0.600	-0.4	2%	BT-0.000	BT-0.000	BT-1.000	-2.828	0.008
				AT-0.503	AT-0.112	AT-1.000		

EFFECT OF TREATMENT ON CHANGE IN SLEEP PATTERN BT & AT

The effect of *Ashwagandha* on change in eating pattern before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score is 1.000 before treatment was reduced to 0.750 after treatment, shows that treatment is statistically significant (P=0.063). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 8: Change In Sleep Pattern BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
1.000	0.750	-0.25	1.25%	BT-0.000	BT-0.000	BT-1.000	-2.236	0.063
				AT-0.444	AT-0.0993	AT-1.000		

EFFECT OF TREATMENT ON CHANGE IN WEIGHT BT & AT

The effect of *Ashwagandha* on change in weight before and after treatment on 20 patients is given below. Statistical analysis revealed that mean score 61.7 is before treatment was reduced to 62.1 after treatment, shows that treatment is statistically significant (P=0.250). Further details of the S.D, SEM, Median, Z value, P value is given below.

Table 9: Change In Weight BT & AT

MEAN		Wilcoxon signed rank test						
BT	AT	Difference in mean	% of improvement	SD	SEM	MEDIAN	Z VALUE	P value
61.7	62.1	-0.40	-0.006%	BT-8.868	BT-1.983	BT-61.7	1.633	0.250
				AT-8.8614	AT-1.926	AT-62.1		

OVERALL EFFECT OF THERAPY

The total effect of the therapy was evaluated based on the patients' improvements. Five patients out of the total number of patients exhibited a little improvement, with less than 15% progress. There were no patients in the mild improvement category, with a range of 15–25%. Seven patients improved significantly, with gains ranging from 25% to 40%. The most promising outcomes were reported in eight individuals who demonstrated excellent recovery with a 40% or greater rise. These findings suggest that the therapy was successful to varying degrees, with a considerable number of patients getting outstanding results.

Table 10: Overall Effect Of Therapy

IMPROVEMENT	SCALE	NO. OF PATIENTS
MINOR	<15%	5
MILD	15-25%	0
GOOD	25-40%	7
EXCELLENT	>=40%	8

DISCUSSION

Stress[8] can negatively impact concentration, memory, and overall performance. Coping with exam-related stress is crucial for students to maintain a healthy balance, both mentally and physically. Chittodvega, also known as "*anavasthitha chitta*" in Ayurveda, is a concept that can be correlated to exam stress. Both *chittodvega* and exam stress involve a state of heightened anxiety and mental distress. In Ayurvedic terms, *chittodvega* is caused by an imbalance in the *dosha (Vata, Pitta,* mainly) and affects the mind, leading to symptoms like restlessness, fear, and difficulty concentrating. Similarly, during exams, students experience increased levels of stress and anxiety due to the fear of failure, performance pressure, and uncertainty about outcomes. This can lead to restlessness, racing thoughts, and difficulty focusing, all of which are similar to the symptoms of chittodvega.

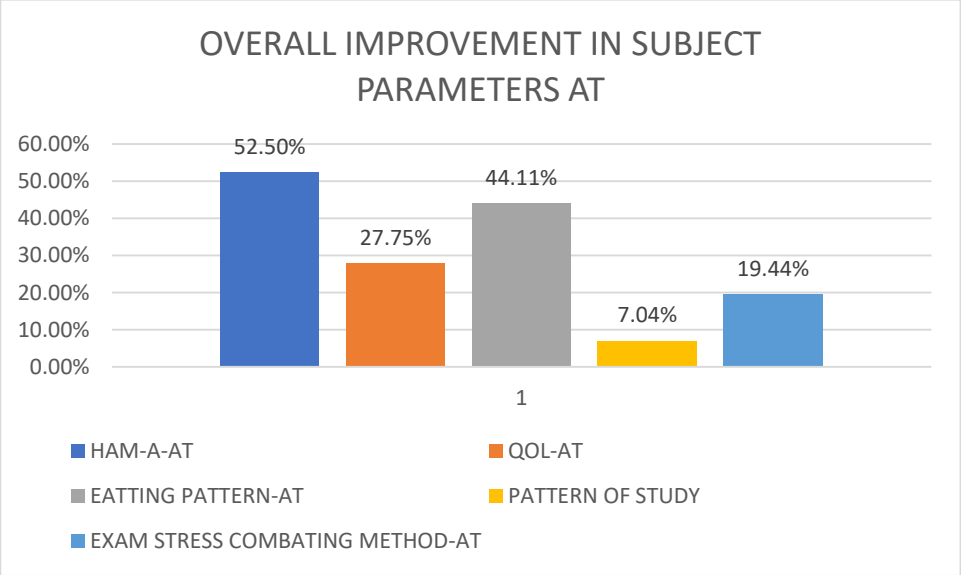
Stress causes neuroinflammation, which increases susceptaibility to causes eating disorder. Chronic stress upregulates serotogenic system and causes dysmorphic mood which results in altered eating pattern. Restricting intake of food or dieting however, reduces serotonin levels and dysmorphic mood, leading to a vicious serotogenic-homeostatic stress/starvation cycle where by cortisol and neuroinflammation increase through stringent dieting.

Ashwagandha's anxiolytic effects may be due to several mechanisms. Firstly, *Ashwagandha* may decrease the activity of the hypothalamic–pituitary–adrenal (HPA) axis[9]. In response to a stress stimulus, the HPA axis indirectly causes an increase in both cortisol and DHEA[10] concentrations. The highest concentrations of DHEA occur between the ages of 20 and 30. *Ashwagandha*'s anxiolytic effects are also associated with its anti-inflammatory and antioxidant effects. Under conditions of stress, depression and anxiety, inflammatory and oxidative processes are increased. *Ashwagandha* inhibits the above-mentioned processes by acting simultaneously on different mechanisms. Although they are discussed separately, the potency of *Ashwagandha* lies in the interaction between them, and is responsible for improving mood in people with depression. In atypical eating disorder, due to the stressor (exam stress) is the culprit behind the change in eating, change in weight, and the stress itself. As already mentioned atypical eating disorder in this study made with special reference to *Chittodvega*, i.e., in modern science we can correlate with generalised anxiety disorder. Due to the *Chittodvega* (anxiety) that is nothing but the exam stress which induced the disordered eating pattern and rest of the symptoms. In *Chittodvega* due to the *Nidana* sevana there is vitiation of *shareerika dosha* mainly (vata & pitta) and *manasika dosha* (rajas& tamas). Results in *manovaha sroto dushti* and ends up with

manifestation of *Chittodvega. Ashwagandha* helps in significant improvements in cognitive function were observed as a result of the inhibition of amyloid β-42, and a reduction in pro-inflammatory cytokines[11] TNF-α, IL-1β, IL-6, and MCP-1, nitric oxide, and lipid peroxidation was also observed. Somniferin[12]: It is a bitter alkaloid with some hypnotic activity, which helps to tackle with the delayed and disturbed sleep. Its rejuvenate and nervine properties produce energy which in turn help the body to settle. This it helps the body to address a stress related condition rather than masking it with sedatives. It rejuvenates the nervous system, erases insomnia and eases stress.

CONCLUSION

OVERALL IMPROVEMENT IN SUBJECT PARAMETERS AT



The subject's metrics improved significantly following the treatment. The Hamilton Anxiety Rating Scale (HAM-A) improved by 52.50%, showing lower anxiety levels. The subject's eating habits improved as well, with a 44.11% improvement. Furthermore, the treatment was successful in combating exam stress, as seen by a significant 19.44% improvement in this area. The subject's quality of life (QOL) also improved, with a 27.75% improvement, indicating a better overall well-being. The study pattern, on the other hand, showed a relatively smaller improvement of 7.04%, showing that there may still be opportunity for future advancement in this area. Overall, the treatment significantly improved the subjects' anxiety levels, eating habits, exam stress coping strategies, and overall quality of life.

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