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The Effect of Cognitive Behavior Therapy (C.B.T.) on Insomnia and Stress. [1, 2]

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1. ABSTRACT-

Prevalence of Insomnia in general population ranges between 10-40% and Stress are fairly common conditions affecting 60- 90% workers, adults and elderly people. Insomnia is difficulty falling asleep or staying asleep. Stress is the behavioral response unable to cope with mental or emotional pressure and physical tension. Both affects day time cognitive functioning, psychological behavior, personality alterations and quality of life. Cognitive- behavior impairment and personality impairment scale questionnaires are designed based on various factors like daily hassles, happiness scale, perception of the present and the future by an individual, personality traits, depressive life events and so on. These questionnaires with certain scoring methods can assess the degree of stress and insomnia involved with root cause analysis.

The appropriate treatment/ counseling with cognitive behavior therapy (CBT) for Insomnia and Stress on the basis of pre-data gathered, Insomnia severity index (ISI), Pittsberg sleep quality index (PSQI), Perceived sleep quality index (PSQI) and Ardell wellness stress test (AWST). The CBT will be highly effective for treating Insomnia and Stress without medicinal interventions and cost effective treatment.

Key words- Insomnia, Stress, CBT, ISS, PSQI, PSS, AWST.

2. INTRODUCTION

Association of impact of stress and insomnia with mental health i.e. cognitive, psychological, personality alterations and with physical health has remained largely unexplored.

Worldwide epidemiological studies assessed the prevalence of insomnia in the general population ranges between 10-40%; when frequency determined, it was in study by Supraksh Choudhry (2019) estimated chronic insomnia 6-10%, in Bangalore. While 20-30% of the general population has poor sleep (i.e., insomnia symptoms of difficulty initiating or maintaining sleep, early morning awakening, or non-restorative sleep at any given time), another 8-10% of the population suffers from chronic insomnia.[1,2] Also, about 4% of the population use sleeping pills in a regular basis.[3]

The prevalence of chronicity of insomnia increases with age, diabetes and is more common in women. Chronic insomnia interferes with personal functioning and causes distress, fatigue, poor cognitive functioning, and mood disturbance.[4] In the elderly, 15%–45% had initial insomnia, 20%–65% moderate insomnia, and 15%–54% late insomnia whereas 10% had poor sleep quality.[5] Chronic insomnia results in

attention and memory deficits which could be misinterpreted as mild cognitive impairment or dementia.[6],[7] In early stage its very difficult to diagnose insomnia but in later stage (moderate), insomnia can be diagnosed.[8] Stress is a global problem with:

- 91 percent of Australians feeling stressed about one or more important parts of their life
- About 450,000 workers in Britain believing their stress was making them ill
- 86 percent of Chinese workers reporting stress

The most common symptoms of stress and the percentage of people who experienced them include:

- **Irritability and anger**: 45 percent of people
- **Fatigue or low energy**: 41 percent
- **Lack of motivation or interest in things**: 38 percent
- **Anxiety, nervousness or worry**: 36 percent
- **Headaches**: 36 percent
- **Feeling sad or depressed**: 34 percent
- **Indigestion, acid reflux or upset stomach**: 26 percent
- **Muscle tension**: 23 percent
- **Appetite changes**: 21 percent

Stress affects the entire body and is linked to many co-occurring mental and physical health problems, like:

- Heart disease
- High blood pressure
- Diabetes
- Depression
- Anxiety
- Insomnia

The diagnosis of a major medical illness often has been considered a severe life stressor and often is accompanied by high rates of depression (Cassem 1995)[9]. For example, a meta-analysis found that 24% of cancer patients are diagnosed with major depression (McDaniel et al. 1995) [10].

In general, individuals in any part of the world are experiencing more stress in daily life, leading to disease susceptibility. Insomnia is very common with the hot & dry climatic region and crisis of fulfillment of needs with minimum wages. So, research question arises- will the stress and insomnia of various reasons affect individuals cognitive, psychological and personality alterations?

3. MATERIAL & METHODS:

The sample of 200 male and females (116 female and 84male) were selected from general population for the study following the research norms. All the subjects were selected as per the present exclusion and inclusion criteria, from OPD of research clinic/ health center of Jiwaji University Gwalior and various camps organized. The cases will be selected strictly as per the present exclusion and inclusion criteria.

Inclusion Criteria of Participants:-

Patients having textual symptoms of Insomnia will be taken as a subject to study. These criteria will be employed before a desiring patient is included in this study.

1. Age-25 to 59 yr
2. Sex: Male / Female
3. Patient who will give written consent.
4. Patients not taking any other treatment for same disease.
5. Willing and able to participate in the study for 04 weeks.
6. Difficulty initiating or maintaining sleep with sleep onset latency (SOL) or wake time after sleep onset (WASO). Superior to 30 minutes, or early morning awakening after sleeping less than 6.5 hrs and a sleep efficiency(SE) below 85%.
7. Insomnia symptoms occurring at least 03 nights per week for at least 02 months.
8. Significant distress or altered functioning in social, occupational or other significant domains.

9. Participants with insomnia who were using medication to facilitate their sleep on an occasional basis (i.e., a maximum of 2 nights per week) were included irrespective of ceasing medication.
10. Meets DSM-IV criteria for mental disorder of stress and sleep disorders- e.g. Axis-I, Axis-IV, Axis-V, other conditions that may be a focus of clinical attention, adjustment disorder, factitious disorder and PTSD.
11. As per textual guidelines of Stress and insomnia mentioned in research studies for inclusion criteria or suggested by guide.

Exclusion criteria of Participants:-

1. Any neurological condition/genetic disorder/mentally retarded likely to interfere with sleep or cognitive functioning.
2. Presence of a current major depressive episode or more than two prior major depressive episode/ attack, generalized anxiety disorder, bipolar disorder and history of or presence of central nervous system and neurological diseases e.g. multiple sclerosis.
3. Substances abuse (including alcohol consumption max. 14 drink for men and 7 drink for women per week) within the past 6 months .
4. Patients having major illness/ systemic pathogenesis eg. Cardiac, renal, hepatic since long time (more than 03 months) will be excluded which may interfere in the study..
5. History of any trauma/ fractured joint / surgical/diagnosticintervention.
6. Gross disability in performing daily normal routine i.e.Bed ridden patients or confined to a wheelchair.
7. Patients with evidence of malignancy, pain related.
8. Patients on prolonged ($\geq$ 12 weeks) medication withcorticosteroids, anticholinergics and for chronic inflammatory conditions e.g. psoriasis etc. or any other drugs that may have an influence on the outcome of the study.
9. Patients who have participated in other clinical trials within twomonths of duration other clinical trial.
10. Any other condition which the guide thinks may jeopardize the study.

Research Design

The present study, mainly concerned with the study of the effect of cognitive behavior therapy (CBT) on insomnia and stress, follows ex post facto design which was exploratory nature. Thus a 2×2×2 ex-post facto factorial design was considered suitable for the study. Each dependent variable was studied separately. Each independent variable in this study had two levels- Pre & Post. Cognition Behavior Therapy (CBT) counseling session at 1st, 7th, 14th, 21st, 28th, 35th, 42th, 49th , 56th , 63rd , 70th , 77th and follow up 84th day for 20-30 minute done to the patients related with Stress & Insomnia.

	CBT EFFECT							
AGE GROUP	INSOMNIA				STRESS			
	ISI		PSQI		AWST		PSS	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
25-35								
36-45								
46-55								
56-59								

Variables are central idea in research that may assume different numerical or categorical values.

I. Independent Variables-

1. Cognitive Behavior Therapy (CBT) .
2. Gender.
3. Age range (25-59)

II. Dependent variable-

1. Insomnia
2. Stress.

Tools of the study-

1. Insomnia severity scale (ISI)
2. Pittsburg sleep quality index (PSQI)
3. Ardell well ness stress test (AWST)
4. Perceived Stress Scale (PSS)

4. DISCUSSION & OBSERVATION

The data was grouped according to the research protocol form (CRF) into demographic profile and clinical profile as per CBT various test tools. All the observations were observed thoroughly. The discussion over the salient features of each part of the study is as follow-

I. DEMORAPHIC DATA ANALYSIS

1. **Age and Gender wise distribution**

According to this the total 116 females and 84 male was enrolled in the study in various age criteria e.g. 25-35 year 42 female and 25 male, 36-45 year 55 female and 42 male, 46-55 year 16 female and 14 male,56-59 year 03 female and 03 male. The highest number of patients suffering with Insomnia & stress was age group of 36-45 year (48.50%) and the second highest (33.50%) was of 25-35 year age group due to various reasons.

2. **Marriage wise distribution**

It's a social union between two different gender people called spouses that creates kinship. In this study 69 Male were married and 15 were unmarried while 98 Female were married and 18 were unmarried suffering from Insomnia and Stress. The highest (49%) Insomnia with Stress noticed in married female while second highest (34.5%) in married males.

3. **Employment wise distribution**

Employment is an agreement between an individual and another entity that stipulates the responsibilities, payment terms and arrangement, rules of workplace, and is recognized by the government law. In our study 32 Male and 30 Female engaged with govt. (31%), 32 male and 23 female with private(27.50%) while 02 male were daily wager. 02 Male and 50 female non working i.e. engaged with their domestic/ homework (26%) while 16 male and 13 female are studying (14.5%). The highest number of people (69%) either related with non-government job or education still after 25 year onward of age.

4. **Menstrual history in Females leads to Stress & Insomnia**

Hormonal changes before and during menstruation may harm sleep (found to have less rapid eye movement/ REM sleep) by effecting body temperature and melatonin production with some physical or emotional changes e.g. Bloating, constipation, cramps, headache, fatigue, anxiety, irritability. The regular/ irregular menstrual cycle may affect the daily life involving the above symptoms. In our study regular with normal periods 69, regular painful period 07 and regular with short duration sufferings 08. The 03 were suffered from regular but prolonged duration period. The irregular with painful period found in o5, short duration in 07 and prolonged duration in 02. Thus, total 32 (27.58%) suffered with painful and short/ pronged regular or irregular periods while 15 (12.93%) Female were at menopaused stage whose daily/ routine life effected with this.

5. **Basal Metabolic Index (BMI)**

It's the value derived from the mass and height of a person, also called ratio of weight and square of height in meter. With this we used to grade the level of obesity. In obese person shorter duration of sleep seen if BMI > 30. Stress hormone cortisol secretes more when higher BMI i.e. above normal as per given table range value. In our study 20 Male and 27 Female were reported

overweight i.e. 23.5 %. While 03 Male and 19 Female were underweight i.e. 11 % , rest 01 Male and 06+01 Female are under Obesity grade i.e. 04 %.

6. **Blood Pressure (B.P.)**

During normal sleep, B.P. typically decreases by 10% or more but the regular sleep disturbances or short sleep linked to develop high B.P. i.e. heart disease and risk factors affecting it including obesity and diabetes. Being under acute stress can also cause our blood pressure to spike briefly. The higher or lower blood pressure indicates Stress. In our study 03 Female low blood pressure, 38 (19%) Male and 64 (32%) Female were found Pre-hypertensive i.e. total 51% while 03 Male and 05 Female were of Stage one hypertension i.e. 04%.

7. **History of Socio-psychological trauma**

In this we asked and record the observations related with exceptional events e.g. divorce, death, financial loss, no child, widow, Accident etc. related issues. We find that 11 (5.5%) Male and 26 (18%) Female thus total 37 (18.5%) have the Socio-psychological trauma.

II. RESEARCH TOOLS & SYMPTOMS WISE ANALYSIS

8. **Emotional Stress & its Relief after CBT**

Emotional stress was noticed on the basis of hyperactivity, impulsivity, interpersonal relationship issues, behavioral mood disturbances and irritability due to any uneasiness, all these observations are recorded in our clinical research form. The 48 (24%) Male and 65 (32.5%) Female are noticed with insomnia and stress. After Cognition Behavior Therapy (CBT) counseling session at 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th}, 35^{th}, 42^{th}, 49^{th} , 56^{th} , 63^{rd} , 70^{th} , 77^{th} and follow up 84^{th} day for 20-30 minute related with Stress & Insomnia, 23 (11.5%) Male and 32 (16%) Females got relieved from Insomnia & Stress i.e. total 27.5% patients relieved.

9. **Physical Stress**

The physical stress was noticed with work overload, fatigue related, various ache/pain, sex, muscle tension, trauma/ accident, assault and with diseases. The 71 (35.5%) Male and 90 (45%) Female came with feeling of physical stress with above mentioned causes. After Cognition Behavior Therapy (CBT) counseling with various sessions 32 (16%) Male and 31 (15.5%) Female thus total 63 (31.5%) got relieved from Insomnia & Stress.

10. **Socio-psychological Stress/ upset**

In this we asked and record the observations related with ongoing worries, concentration inability, feeling helpless, quarrelsome, uncaring husband, child job in other state, court case witness, poverty and academics related issues. We find that 27 (13.5%) Male and 52 (26%) Female.. After Cognition Behavior Therapy (CBT) counseling session at 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th}, 35^{th}, 42^{th}, 49^{th} , 56^{th} , 63^{rd} , 70^{th} , 77^{th} and follow up 84^{th} day for 20-30 minute related with Stress & Insomnia 10 (5%) Male and 26 (13%) Females got relieved from Insomnia & Stress i.e. total 36 (18%) patients relieved.

11. **Excessive daytime sleepiness (EDS)**

Many sleep disorders manifest with insomnia and usually Excessive daytime sleepiness (EDS). EDS is the tendency to fall asleep during normal waking and productive hours of work.. In this study 38 (19%) Male and 68 (34%) Female are recorded with EDS of which 34 (17%) male and 43 (21.5%) Female got relieved with our CBT-I & CBT-S counseling, thus 77 (38.5%) got relieved.

12. **Excessive electronic use**

In this study we have observed that electronic devices use can cause overstimulation before bed and - if not managed properly – cut into sleep time. The devices interfere with our circadian rhythm, exciting or violent video games, notifications increase heart rate and impair sleep quality. Also according to separate

survey 40% children own a cell phone by the 5th standard, and of which 60% of children use electronic devices in the hour before sleep. In our study 72 (36%) Male and 75 (37.5%) Female used electronic device mobile and laptops, TV etc. of which after counseling with CBT 34 (17%) Male and 35 (17.5%) Female got relieved i.e. out of 73.5% people using electronic device and suffering with stress & Insomnia, 34.5 % left excessive use of electronic devices.

13. **Stress Type**

In our study 64 (32%) Male and 80 (40%) Female are suffered with Acute stress while 20 (10%) Male and 45 (22.5%) Female are suffered with Chronic Stress. But after treatment with CBT-S the 36 (18%) Male and 45 (22.5%) Female got relieved with these conditions thus total relief was 40.5%.

14. **Body Pain**

With the physical stress various conditions the body pain shown in 32 (15%) Male and 41 (20.5%) Female of which 06 (3%) Male and 04 (2%) Female got relieved thus total 10 (5%) patients got treated after Cognition Behavior Therapy (CBT) counseling session at 1st, 7th, 14th, 21st, 28th, 35th, 42th, 49th , 56th , 63rd , 70th , 77th and follow up 84th day for 20-30 minute related with Stress & Insomnia.

15. **Restlessness**

It may affect our mental state and experienced as an inability to remain at rest, difficulty in concentrating, not being able to relax or being constantly uneasy which leads to stress with insomnia. It may associated with depression, bipolar disorder, anxiety, dementia, hyperthyroidism. In our study 26 (13%) Male and 36 (18%) Female felled restlessness of which 5 male and 6 female got relieved. Thus total 5.5% patients got treated with CBT from this symptoms.

16. **Irritability**

Its also called crankiness is the excitatory ability that living organism have to respond to changes in their environment. All these observations are recorded in our clinical research form. The 21 (10.5%) Male and 31 (15.5%) Female are noticed with insomnia and stress. After Cognition Behavior Therapy (CBT) counseling session at 1st, 7th, 14th, 21st, 28th, 35th, 42th, 49th , 56th , 63rd , 70th , 77th and follow up 84th day for 20-30 minute related with Stress & Insomnia, 03 (1.5%) Male and 05 (2.5%) Females got relieved from Insomnia & Stress i.e. total 04% patients relieved.

17. **Anxiety**

It is the feeling of fear, dread, and uneasiness. It might cause to restlessness and rapid heartbeat. It is the normal reaction to stress. Excess worry and fear make it harder to fall asleep and stay asleep through the night. And vice versa we can say the sleep deprivation can worsen anxiety and stress also. In our study 18 (9%) Male and 26 (13%) Female were noticed to suffer with anxiety disorder also along with insomnia and stress. With the CBT treatment/counseling 01 Male and 03 Female thus total 04 (2%) people relieved with this anxiety disorder.

18. **Anger**

It's a strong feeling of being upset or annoyed because of something wrong or bad: the feeling that makes to shout and being angry. The anger, anxiety, sadness and irritability symptoms depend on mental condition along with people surrounding conditions/ relation. In this study 17 (8.5%) Male and 23 (11.5%) Female are feeling anger frequently in which 03 Male and 05 Female, thus 08 (4%) people got relieved from frequent annoyed/ anger condition.

19. **Sadness**

The feeling of being unhappy, especially because something bad has happened. Its an emotional pain associated with feeling. In this study 13 (4.5%) Male and 19 (9.5%) Female are feeling sadness due to various life events in their life. But After Cognitive Behavior Therapy related with insomnia & stress 06

Male and 07 Female relieved from getting sadness, thus total 13 (4.5%) people changed their mental status of getting sad.

20. **Bed Time Improvement after CBT**

In the Insomnia study the bedtime has its own importance as if any person used sleep late in night it will automatically reduce its sleeping hours. In this study we found that 43 Males and 61 Females used to seep before 11:00 pm but somehow due to increased number of their waking episodes, the peoples are not completing their 8 hrs of sleep. While on the other hand 41 Male and 55 female used to sleep after 11:00 pm which automatically reducing their sleeping hrs as of late sleep at night. So out of 200 patients after CBT the sleeping bed time improvement seen in 40 which shows the 20 % improvement.

21. **Sleep Onset Latency (SOL) Improvement after CBT**

Sleep latency is the time it takes a person to fall asleep after turning the lights out. On average, a healthy person takes between 5- 10 minutes to fall asleep. The 28 (14%) Male and 48 (24%) Female are noticed with less than 10 minutes which is improved in 25 (12.5%) Male and 24 (12%) Female despite normal range, while 56 (28%) Male and 68 (34%) Females had more than 10 minute SOL which is improved in 31 (15.5%) Male and 30 (15%) Female after Cognition Behavior Therapy (CBT) counseling session at 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th}, 35^{th}, 42^{th}, 49^{th} , 56^{th} , 63^{rd} , 70^{th} , 77^{th} and follow up 84^{th} day for 20-30 minute related with Stress & Insomnia. Thus the SOL improved towards normal in 110 (55%) people after CBT.

22. **Number of waking episodes Improvement toward ZERO W.E. after CBT**

In this study the waking episode (WE) 01 in 27, 02 in 26, 03 in 09 Male and 01 in 34, 02 in 26, 3 in 26 Female thus total 148 (74%) people have interrupted sleep with 1,2,3 waking episodes, the highest waking episode seen in female. After Cognition Behavior Therapy (CBT) counseling session at 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th}, 35^{th}, 42^{th}, 49^{th} , 56^{th} , 63^{rd} , 70^{th} , 77^{th} and follow up 84^{th} day for 20-30 minute related with Stress & Insomnia the improvement with zero waking episodes seen in 67 (33.5%) people to sound sleep.

23. **Improvement in Sleep hours**

According to the National sleep foundation and the research done by the Hirshkowitz, Whiton K., Albert SM (et all) 2015; the adults between 18- 64 year needs 7-9 hrs of sleep. In our study 200 patients facing the above problem after getting Cognitive behavior Therapy 18 (9%) enjoyed more than 8 hrs of sleep while 27 (13.5%) Male and 36 (18%) Female started their normal sleep 7-8 hrs daily. Thus 36 (18%) Male and 45 (22.5%) Female, total 81 (40.5%) people restored to normal sleep after Cognition Behavior Therapy (CBT) counseling session at 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th}, 35^{th}, 42^{th}, 49^{th} , 56^{th} , 63^{rd} , 70^{th} , 77^{th} and follow up 84^{th} day for 20-30 minute related with Stress & Insomnia.

III. STATISTICAL DATA ANALYSIS

Statistical analysis was carried out with the Pre and Post CBT in Stress and Insomnia comparison according to the mean difference, variances difference, p-value at 0.01 level and F-ratio/ calculated with F-critical/table value in all age groups 25-35, 36-45, 46-55, 56-59 years and we found that-

1. The observed difference between the group is statistically significant with low P and rejecting almost to all null hypothesis i.e. more data disagreement (suggesting the group being studied; their data is incompatible with null hypothesis) while in some with high P indicates: fail to reject some null hypothesis i.e. the group being studied are almost same. But comparing F-ratio/ calculated with F-critical/table value in rows as well as in column by ANOVA two factor without replication indicates rejecting null hypothesis.

2. It shows that CBT is effective at the 1% level of significance and in some other hypothesis at 5%.

5. RESULT AND CONCLUSION

As this study was open random and prospective based on CBT counseling without medication before and after (i.e. Pre & Post) treatment we found that-

1. Almost all values found to be significant statistically (P<0.01) and in a few with P<0.05.

2. The stress and Insomnia treatment with cognitive Behaviour Therapy (CBT) is found effective.

3. Overall assessment score shows the total cure with CBT is 43.5 % i.e. 87 patients got relieved out of 200 participants.

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7. List of Publications of the candidate:-

- "Kanchanar guggulu an Ayurvedic polyherbal formulation"-Review Artical published in Ayushdhara Journal 2018.
- "Ayurveda & Healthcare Management" in Souvenir 2019, jiwaji University, Gwalior(MP).
- "Study on Patient satisfaction in healthcare" in Souvenir 2019, jiwaji University, Gwalior(MP).