

Effect of Moderate-Intensity Aerobic Exercise on Efficiency of Sleep, Quality of Life, and Mental State in Insomniac Young Adults

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Abstract:- The Aim of the study is to determine the prevalence rate of insomnia and to correlate with quality of life and mental status among young adults, to determine the effect of exercise on sleep. **Methodology:** the study was designed as an experimental study, study setting was done Saveetha Medical Hospital, sample size was initially 117 and then 21 in which 15 were females and 6 were males. The materials required are ISI, SF 36 and POMS questionnaire, pedometer. The three questionnaires were given to 171 young in which 86 Individuals screened with insomnia and their prevalence rate, their quality of life, mental status score was recorded. Result shoes the prevalence rate of insomnia was 73.3% among young adults in which 66.6% have subthreshold insomnia, 27.77% have mild and 5.55% have severe insomnia SF and POMS questionnaire shows that they have poor quality of life, confusion, and anger. The pre-interventional score of moderate insomniac individual was ISI 18.2, POMS 37 and SF 36 was 38.5 respectively and post-interventional score was ISI 10.8, POMS 22.7 and SF 36 was 55.6 respectively and reduced anger and confusion and increased quality of life. Hence, we conclude that Increase in the physical activity leads to good sleep.

Keywords:- *Insomnia, Young Adults, Quality of Life.*

I. INTRODUCTION

Insomnia is simply known as as sleeplessness where people have trouble in sleeping¹ but its actual definition means “difficulty in initiating and maintaining sleep”². The Characteristic features of insomnia are difficulty in initiating sleep, maintaining sleep and waking up early, Daytime impairments, fatigue, poor mood, impaired concentration^{2 to 5}.

There are many kinds of interventions and treatments are available for insomnia but they also have some kind of drawback e.g. In pharmacotherapy the treatment may be effective and cheap but it has some dangerous adverse effects, behaviour therapy and cognitive therapy are more expensive hence some patient cannot afford for the

treatment^{7,8,9}. Apart from this treatment exercise plays a major role in insomnia because exercise has an Anxiolytic and anti-depressant effect due to release of endorphin and dopamine will induce sleep and reduces mood disorder and improves the quality of life¹⁰.

Hence the study uses exercise as an intervention it is cheap, more effective with no adverse effects. The Aim of the study to determine the prevalence rate of insomnia and to correlate with quality of life and mental status among young adults, to determine the effect of exercise on sleep and to determine effect of sleep on efficiency of exercise

II. METHOD

The study is designed as experimental study. Study setting was done in Department of physiotherapy, Saveetha Medical Hospital, Thandalam, Chennai-601205. Sample size was 21 individuals in which 15 were females and 6 were males. The total duration of the study was 12 weeks. Materials required are, Insomnia severity index questionnaire (ISI) – to screen insomnia and its severity, Short Form (SF) 36 questionnaire – to assess the quality of life, Profile Of Mood States (POMS) questionnaire – to assess the mental status, Pedometer – to monitor the intensity of the exercise

Inclusion criteria were young adults between the age of 18 to 30 years, Individuals screened with moderate insomnia were included for moderate intensity aerobic exercise and Complaints of insomnia more than 3 months. Exclusion criteria were drug induced insomnia, Individuals are already under medications for insomnia, Night workers and Cardiac abnormalities. The three questionnaires were given to 171 young (98 female and 73 males) adults between the age 18 to 30. In which 86 (52 females and 34 males) Individuals screened with insomnia and their prevalence rate, their quality of life, mental status score were recorded.

Based on the inclusion and exclusion criteria Only 21 samples were selected for experimental part of the study their quality of life, mental status and insomnia score were recorded as Pre- interventional score respectively.

Moderate intensity aerobic exercise was given for 20 min and two session per day along with dance therapy was given for 21 members for 12 weeks. After 12 weeks again three questionnaires were given to 21 samples and their score of insomnia, mental status and quality of life was recorded as the Post- interventional score.

➤ *Treatment protocol:*

- Duration: 20minutes
- Sessions: 2 sets/ day
- Total duration: 12 weeks
- Intensity: 50 to 60% of maximum heart rate (the maximum heart rate is calculated by $220 - \text{age}$)

III. RESULTS

The mean and standard deviation of ISI score were 10.84 ± 2.44 in subthreshold, 18.4 ± 0.22 in moderate, and 24.25 ± 2.21 in severe insomnia respectively and the total prevalence rate of insomnia was (86) 73.50% among young adults in which (57) 66.67% have subthreshold insomnia, (24) 27.91% have moderate and (5) 5.81% have severe insomnia as shown in Figure 1 and Table 1. The mean score of SF 36 questionnaire was 33.4 ± 2.78 and the mean and standard deviation of POMS questionnaire was 35.2 ± 3.27 respectively and thus the SF 36 questionnaire shows poor quality of life and POMS questionnaire shows that the individuals in confusion, and anger as shown in Table 2 respectively.

In exercise sample the mean and standard deviation of pre-interventional score for moderate insomniac individual was ISI 18.2 ± 0.06 , POMS 37 ± 1.75 and SF 36 was 38.5 ± 1.26 as shown in Table 3 respectively. The mean and standard deviation of post-interventional score was ISI 10.8 ± 1.25 , POMS 22.7 ± 1.05 and SF 36 was 55.6 ± 2.25 as shown in Table 4 respectively. There is an increased sleep, reduce in anger and confusion in POMS questionnaire and increased quality of life in SF 36 questionnaire as shown in Figure 2. Additional to it many individuals self-reported that exercise induces their sleep and this good sleep has improved the efficiency of the exercise in the next day session.

IV. DISCUSSION

Insomnia is defined as difficulty in initiating and maintaining sleep². Non-pharmacological treatments are often preferred by patients and physicians due to concern over side effects and increased mortality in hypnotic users^{7,8,9}.

Aerobic exercise has been tested in multiple studies as a non-pharmacological intervention for sleep in older adults that has general health benefits and is readily accessible to most individuals^{8,12}. The benefits of exercise on insomnia

symptoms are most consistent for self-reported sleep quality and sleep diary-based measures¹⁰.

Selcuk et al has determined the prevalence rate in subthreshold insomnia as 32.2%, moderate as 17.6% and severe insomnia as 4.9%¹¹, Hohegan et al has determined the prevalence rate of insomnia in subthreshold as 26.2%, moderate as 16.4% and severe insomnia as 12.3%¹², Siegfried et al has determined that 6.35% have subthreshold, 1.8% have moderate and 1.9% have severe insomnia¹³ but in our study we determined that 66.6% have subthreshold insomnia, 27.77% have moderate and 5.55% have severe insomnia, our study shows a significant raise in the prevalence rate it may be due to poor physical activity of the individuals and additionally our study has correlated insomnia with the quality of life and mental status.

Epidemiological studies have reported an association between exercise and decreased complaints of insomnia¹⁴, as well as a relationship between low levels of physical activity and a greater prevalence of insomnia¹⁵. However, there has been very limited experimental investigation of the effects of aerobic exercise training on sleep in individuals with insomnia has improves the sleep quality^{16,17}. West J et al has determined that dance reduces stress, depression and anger hence in our study also both dance and exercise has significantly reduced anger, confusion and depression respectively¹⁸. Gisella et al has determined that exercise improves sleep and mental stress and a good sleep improves the efficiency of the exercise and their study supports our study¹⁹. Jacob et al has determined that high intensity aerobic exercise will not improves sleep it worsens the sleep²⁰.

Many studies have reported only that exercise improves sleep and reduces insomnia but additionally in our study we determined that exercise not only improves sleep but it also improves the quality of life and mental status among the young adults.

Insomnia is seen as a hidden problem in many young adults but in future it may leads to coronary artery disease, obesity, poor immune system, diabetes, psychological problems such as depression, anxiety, low performance and delayed reaction time respectively²¹. Hence it should be diagnosed and treated soon.

V. CONCLUSION

Insomnia may be seen hidden in many individuals and it is concerned about physicians when it is severe. Due to sudden rate in the prevalence rate of insomnia, it should be considered as important and hence screening should be done for insomnia in daily practice. Many young adults are affected because of insomnia and this in turns affect the individual's quality of life and mental status but exercise have ability reduces the anger and confusion and leads to a good quality of life and a good sleep have ability to improve the efficiency of exercise. Hence, we conclude that Increase in the physical activity or exercise leads to good sleep.

➤ Prevalance Rate of Insomnia

| LEVELS OF INSOMNIA | MEAN SCORE OF ISI | STANDARD DEVIATION OF ISI | NO.OF INDIVIDUAL AFFECTED | PERCENTAGE (%) |
|--------------------|-------------------|---------------------------|---------------------------|----------------|
| Subthreshold | 10.84 | 2.44 | 57 | 66.28 |
| Moderate | 18.4 | 0.22 | 24 | 27.91 |
| severe | 24.25 | 2.21 | 5 | 5.81 |

Fig 1:- Example of a figure caption. (figure caption)

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