Chapter V

DISCUSSION

“If sleep does not serve as absolutely vital function, there it is the biggest mistake the evolutionary process ever made.”

- Alan Rechtschaffen, University of Chicago

Sleep occupies one-third of our lifetime. It is a vital function that affects cognition. It also reflects human performance, mental and physical health. The problems of sleep among the elderly living in old age homes are multifactorial. Ageing biology, sleep physiology, behaviour and environment are various factors that contribute to the same.

For many of the senior citizens, bedtime is the hardest part of the day (National Institute of Ageing 1990). Disorders in sleep pattern among the elderly include difficulty in falling asleep, less time spent in the deeper stages of sleep, early morning awakening and sleepiness during day time (Neubauer 1999, Telles Reddy and Nagendra 2000). A variety of factors may influence sleep in an older person. Institutionalised elderly are at risk of developing sleep disturbances. Thus, it is essential to assess the sleep pattern among
the elderly, and also there is a pressing need to test the interventions to promote sleep among the elderly, in order to improve their productive life.

Regular practice of physical activity and relaxation techniques have proven to improve sleep and increase the chances of awakening feeling refreshed among the elderly institutionalised subjects. Considering the needs and problems of the elderly and to ensure them a better quality of life, the researcher has made an attempt to study the “effectiveness of nursing interventions and progressive muscle relaxation techniques with deep breathing exercises on promoting sleep among the elderly residing in old age homes in and around Puducherry”.

The objectives of the study are as follows:

1. To study the sleep patterns and disturbances that arise during sleep among the subjects residing at old age homes.
2. To identify the various factors that cause sleep disturbances among the subjects residing in old age homes.
3. To assess the effectiveness of nursing interventions on sleep after such intervention among subjects residing at old age homes.
4. To determine the effectiveness of progressive muscle relaxation with deep breathing exercises on sleep after
such intervention among subjects residing at old age homes.

5. To study the comparative effectiveness of the interventions on sleep among the experimental group I (nursing interventions) experimental group II (relaxation technique) such as progressive muscle relaxation with deep-breathing exercise and control group III on sleep among subjects residing at old age homes after post-test.

A quasi-experimental design was adopted for the study. For purposes of this study, a total of 150 subjects were selected from 5 old age homes by using convenience sampling technique. Out of the 150 subjects 50 subjects were allotted to experimental group I (nursing interventions), 50 subjects were allotted to experimental group II (progressive muscle relaxation techniques with deep breathing exercises) and the remaining 50 subjects were allotted to control group III who were not exposed to any interventions. Finally, the results of such interventions on group I and group II were compared with control group III (which was not exposed to any interventions).

Demographic characteristics of elderly and their association with sleep pattern residing in old age homes

The study results on the Demographic Variables revealed that out of 150 subjects, 51 (34%) subjects ranked top in the age group above 75 years, 46 (30.67) of the subjects were in the age group of
60–65 years and around 27 (18%) of them were in the age group of 71–75 years. Gonozatez Garcia et al. (1991) reported that out of 329 elderly aged people (above 60) surveyed, one-third of the subjects exhibited sleep disturbances. The studies undertaken by various scientists on sleep pattern of the elderly are furnished below.

Sleep disturbances are common among the elderly and is thought to be a normal consequence of old age (Flinsilver, 1993; Johnson JE 1994; Bandlie 1998; Avidan, 2002; Lamberg, 2003; Hoffman 2003; Mazza et al., 2005, Wolkove 2005, Ancoli-Israels 2008).

Liu and Liu (2005) conducted a study of 1800 individuals aged 65 years. The study showed that 32.9% of the elderly persons suffered from insomnia. Godard (2006) reported that 57% of elderly experienced sleep disturbances.

Adam Gordon and John Gladman (2010) reported that sleep problems which cause disturbances in sleep among the elderly are common. Various studies from 1993 to 2010 had revealed that ageing is associated with significant changes in sleep.

The present study was conducted to find out the relationship between ageing and sleep. The results suggested that the reasons attributed to the data were primarily due to ageing. Ageing is part
of life and its degenerative nature exposes the individual to general physical and psychological problems which are responsible for causing sleep disturbances.

With regard to the gender 72.67% of the subjects were females and 27.33% were males. The reason for this was that women respondents were predominantly homemakers. In a national surveillance survey conducted by Twery (2010) reported that women are two or three times more likely to suffer from insomnia than men.

With respect to marital status majority 36.67% of the subjects were unmarried. Nearly 32% of the subjects were married and around (31.33%) of the subjects were widowed and separated from their family.

With respect to religion, 64.67% of the subjects were Hindus, nearly 34% of them were Christians and very few 1.33% were Muslims. Out of 150 subjects, those who were residing in semi-urban areas 42% were found to rank first, followed by those residing in urban areas (37.33%) and those residing in rural areas (20.67%). With respect to family type, majority of the subjects 66% were from nuclear families and the rest (34%) of them were from joint families, since the traditional system of living in joint families has been given a decent send off.
The result of the present study with respect to ‘Previous Occupation’ showed that 58.67% of the subjects were housewives, top the ranking of the respondents. The results determined in connection with previous monthly income state that ‘No Income’ group was found to be on the top of the ladder with the subjects numbering 88 (58.67%). And Last in ranking were subjects falling in the income group of Rs. 10,000 and above, which numbered one (0.66%). The reason assessed by the experimental study for this was the role ‘previous income’ played in the status of the elderly, which has delivered the Senior Citizens at the doorsteps of the institution.

In the present study it was found that out of 150 subjects, (87.33%) of them were dependent on old age homes for their livelihood. About (8%) of the subjects received old age pension and very few (4.67%) received financial assistance from their children during their stay in old age homes.

In the present study the result with respect to the reason for their opting admission to old age homes reveals that social security requirements takes the lead with 32.67%, followed by negligence or rejections (21.33%), own interest (14.67%) and basic needs (12.67%) respectively. The least significant reason reported was for unresolved conflict with spouse (only 8%). All these led senior citizens to find a secure place for old age – the old age home. 

Dandekar (1993) reported, lack of homely care as one of the
prominent reasons added by the elderly towards their preference to stay in old age homes. This showed the need and rise of old age homes in the modern social life.

The finding of the present investigation with respect to duration of stay, the study reveals that a period of more than one year accounted for the highest number and percentage, with 108 subjects (72%) and the rest (28%) of them stayed for less than a year.

With respect to the general health status and hospitalisation during their stay in old age homes revealed that majority of the subjects (86.7%) suffered from chronic illness and the rest (13.33%) were healthy with good physique and without any health-related problems. With respect to the hospitalisation during their stay in old age homes, a minimum of 26.67% subjects were hospitalised for chronic illness from time to time as and when required and nearly 73.33% of the subjects did not require hospitalisation.

From the above findings, the present study suggests that age, gender, marital status, place of residence, occupational status, general health status and duration of the stay in old age homes did not have any relationship with the sleep pattern of the elderly, and this is proved by regression analysis.
Further, the researcher aimed to assess the sleep pattern of the elderly and the factors causing sleep disturbances.

The first objective of the study was to study the sleep pattern and the sleep disturbances that arise during sleep among the subjects residing at old age homes.

The sleep pattern was assessed based on the subjective data related to sleep description, sleep quality, time taken to initiate sleep, total number of hours spent in the bed which included sleep time and time they were and awake in bed, the actual hours slept by the subjects, habit of waking up in between sleep, frequency of sleep interruptions and early morning awakening i.e. time of getting up from bed.

Normal Sleep pattern among elderly

Normal sleep pattern of the elderly and the quality of sleep depend on sleep onset, ability to sleep continuously without any disturbances and the duration of sleep for 5–6 hours. Also it depends on whether they wake up with the feeling of refreshed in the morning.

The finding of the present study are furnished below:

Sleep description

Good refreshing sleep is essential for health (Leigh LP, 1991; Rajpur et al. 1999). The study findings describe the sleep pattern among elderly residing in old age homes. Out of the 150 subjects
that participated in the study, majority (67.33%) of the subjects described their sleep as not-refreshing and only 32.67% of the subjects described their sleep as refreshing.

A study conducted by \textbf{Ohayon (1996)} reported that 20% of the older persons were unsatisfied with their sleep. \textbf{Ohayon (1999)} of 5622 subjects aged 60 years and the residents showed that 20.1% were unsatisfied with their sleep. \textbf{Ohayon and Roth (2001)} in their cross-sectional study stated that 8.9% of the subjects reported that they had non-restorative sleep. \textbf{Foley et al., (2004)} in their survey about sleep problems among 9,000 subjects aged 65 years stated that about 7–15% of the subjects never felt refreshed after waking up in the morning. Though their finding was similar to the findings of the present study, the number of subjects who said that their sleep was not-refreshing were four times more than in the present study.

\textbf{Sleep quality}

In the present investigation with respect to sleep quality it was found that 55.33% of the subjects rated their quality of sleep as poor. Nearly (19.33%) reported as having experienced fair and only 10% of the subjects rated their quality of sleep as good. This finding is supported by the findings of an international study on institutionalised elderly, which states that half of the study
participants (48%) cited poor quality of sleep as their predominant symptom (Leger D et al., 2005).

As age increases stage III and stage IV of NREM (Non-Rapid EYE Movement) sleep totally diminishes, or sometimes stage IV is totally absent. Stage IV, called as restorative sleep, plays an important role in determining sleep quality. Polysomnographical investigations have supported these findings and have revealed gradual decrease in stages III and IV of sleep, and an increase in stage I of sleep (Doghramji 1999; Neubauer 1999; Benet 2004 Kawinaska et al., 2004, Ancoli-Israel 2005). Further, it is reported that the elderly fall asleep earlier in the evening due to circadian rhythm changes, or they wake up more earlier in the morning than desired and cannot fall back to sleep easily (Liu and Liu, 2005).

**Time taken to initiate the sleep (sleep onset latency)**

In the present study it was found that, out of 150 subjects majority (49.33%) of the subjects took more than 60 minutes (1 hour), and 38 (25.33%) of them took one hour and less to initiate sleep. This shows that most of the elderly persons had difficulty in initiating sleep, which was found to be one of the common sleep disturbances among the subjects.
Carskadon and Dement (1981), Dement, Miles, and Dement (1982), Miles and Carskadon (1990) suggested that older adults in the group were more affected by the disorder of initiating sleep. Further, a cross-sectional survey conducted by Ohayon and Roth (2001) with 240 subjects showed that 27% of the subjects had difficulty in initiating sleep, which is two times higher than the findings of the present study.

Su, Huang and Chou (2004) concluded that 8.4% had difficulty in falling asleep. In a similar study conducted by Hoch Strasser (2010), 1.6% of the subjects were found to be having problems in initiating sleep.

Rosen (2005) discussed that elderly persons normally had difficulty in initiating sleep due to their medical and psychological problems. Ancoli- Israel, Ayslon and Salzman (2008) support the fact that older adults have difficulty in initiating sleep. Therefore, it is strongly suggested that one of the most important sleep problems faced by the elderly is difficulty in initiating sleep.

The common reasons contributed for difficulty in initiating sleep are as follows:

**Decreased Physical Activity:** Majority of the older adults remain inactive during their leisure time in old age homes, which is considered as an important factor. This is explored in the present
study. During the period of study it was found that out of 150 subjects (99.33%) of them were neither involving themselves in any form of regular physical activity nor doing any regular physical exercise during their stay in old age homes. Only one subject was found to be active (Table 4.14). The researcher observed that the elderly were ideally sitting and lying down in the home without any physical activity. Therefore, reduced physical activity during daytime in the old age home was found to be one of the reasons for the subjects having difficulty in initiating sleep.

**Day-time nap and the duration of nap were also associated with initiating nocturnal sleep.**

The present study results showed that out of 150 subjects 92 (61.33%) of the subjects had day-time nap. Out of these 92 subjects 61 (40.67%) of them took a nap for more than 30 minutes/day and 27 (18%) of them took a nap at least twice in a day. The results showed that 61 (40.67%) of the subjects nap excessively during daytime in old age homes. Day-time naps can lead to desynchronization of the circadian rhythm in the sleep-wake cycle and thus contribute to sleep pattern disturbances.

Metz and Bunnell (1990) conducted a study to explore the relationship between day-time napping and nocturnal sleep disturbances. The results indicated that age had the greatest effect on napping, with older adults taking more frequent and longer naps.
This was one of the reasons that caused sleep disturbances among elderly. This finding supports the findings of the present study.

**Hochtrasser (1993)** concluded that 1.6% of the subjects were found to have day-time sleepiness that caused sleep disturbances. The above studies strongly support the fact that elderly subjects should avoid napping during day time, and if they nap during daytime this may lead to sleep disturbances.

**Beeker and Jamieson (1992) and Neubauer (1999)** support the finding that the day-time napping contributes to sleep disturbances. It increases the effects of ageing. Finally, they conclude that the duration of nap may be associated with difficulty in initiating sleep. But no significant relationship was observed between day-time napping and nocturnal sleep difficulty, and literatures also reported that the elderly compensate their sleep disturbances through day-time napping. But the present study strongly suggests that day-time nap was one of the significant factors that caused sleep disturbance.

**Anxiety / Depression**

Various literatures suggest that when the elderly subjects were depressed/anxious before sleep, they had more severe sleep disturbances. The present study findings also showed that out of 150 subjects, 38.6% of the subjects reported that if they were
anxious and depressed before going to sleep, it delayed their falling asleep. Also they took a longer time to initiate their sleep. Lack of physical activity can also lead to depression and thus to tiredness and fatigue, which can contribute to the difficulty in initiating sleep among the elderly.

The study conducted by John M.W documented that psychological stressors are the main cause of disturbed or insufficient sleep. A person if anxious and depressed, takes longer time to fall asleep. Anxiety and depression are highly correlated with insomnia.

Use of Medication

As age progresses elderly subjects use a variety of medications for their chronic illness; this is one of the factors that causes sleep disturbances. The present study findings showed that 13 (8.67%) of the elderly subjects occasionally took medication for sleep and minor ailments. Most of the elderly subjects were on regular prescribed medication for their chronic illness such as diabetes mellitus (13.33%), hypertension (24.66%) and pain (7.33%), respectively. Side effects of certain medications had also caused difficulty in initiating sleep among the elderly subjects.

Johnson (1994) reported that sleep disturbances are common. Nearly half of the sedative-hypnotics prescribed were for
persons aged 65 years and above. Nearly 16% were receiving sleep-enhancing medications. The present study results are also supported by the above-said reasons.

**Maintenance of Sleep**

Factors involved in the maintenance of sleep include duration of sleep, actual hours slept, waking in between sleep number of times they were disturbed and difficulty in getting back to sleep once they were disturbed.

The present findings showed (47.33%) of the subjects remain in bed for five hours, 26.67% of the subjects remain in bed for 6 hours and 26.67% of the subjects remain in the bed for 7 hours and 85 (56.67%) actually slept for less than 4 hours in a night. Out of 150 subjects, (85.33%) of them woke up after the onset of sleep, 42.97% were interrupted once (39.84%) were interrupted at least 2–3 times during night time and 17.19% were interrupted more than 3 times. Nearly 78.91% had trouble in getting back to sleep once they were disturbed.

**Benet (2000), Shochat et al. (2001)** reported that factors such as medical, psychological problems, medications and circadian rhythm changes had caused difficulties during sleep at night. Further, they concluded in their study that 50% of the subjects wake up at least twice during night, and hence their sleep was so
fragmented (Bundle 1998, Vitiello 2000) that they rarely experienced even a single hour of consolidated sleep (Aucoli-Israel and Parker et al., 1989).

Jacob et al. (1989) reported that elderly persons normally had difficulty in maintaining sleep, due to medical, environmental psychological and physical problems.

Ohayon (2008) reported in his cross-sectional study that nocturnal waking had occurred among one-third of the elderly subjects due to physical and psychological problems.

Foley et al (1995) findings showed that 23–24 % of the subjects had difficulty in maintaining sleep.

Ancoli-Israel, Ayalon and Slazman (2008) proposed that 84% of the subjects aged 65 years and above had difficulty in maintaining sleep.

Martin et al. (2000) in their review articles concluded that sleep became more disturbed and fragmental among old age home subjects than community-dwelling older adults.

Rosen (2005) and Adam and Gladman (2010) reported that sleep problems are more in institutionalized elderly and are
associated with poor sleep and maintenance of sleep, apart from the medical and psychological problems faced in old age homes.

**Ohayon (2008)** conducted a study to assess nocturnal awakening in the elderly. The study concluded that one-third of the elderly wake up during night time; 35.5% of the subjects reported waking up at least three times at night/week, 23% reported waking up at least once every night, 4.5% reported waking up 5–6 times at night/week and 7.9% reported waking up 3–4 times at night/week. **Leger D et al. (2005)** reported that 9% of the subjects wake up 3 times/week during night time.

**Maurice and Ohayon (2009)** conducted a cross-sectional study in the UK and showed that 31.2% of subjects reported waking up 3 times at night; 7.4% of the sample experienced difficulty in getting sleep after waking up.

Therefore, the study findings conclude that nocturnal awakening due to physical problems such as pain, urge to urinate environmental factors such as noise and light raised due to the frequent use of toilet by the inmates during night in the old age homes and psychological problems anxiety and depression commonly led to more fragmented sleep among the elderly.

Older adults spend more time in bed relatively to time spent asleep (**Bliwise, 1992**). This is due to the long time taken to fall
asleep, more periods of wakefulness during the night and long time spent awake, before rising in the morning (Hays JC, Blezer, Foley, 1996).

**Early Morning Awakening**

The present findings show that with respect to early morning awakening, out of the 150 subjects, (54%) subjects wake up between 4 and 5 a.m. in the morning and (40%) of them wake up before 4 a.m. Ohayon and Roth 2001 observed that 18.9% of the subjects woke up early morning and 10.9% had non-restorative sleep.

Ancoli-Israel (2004) reported in their study that medical conditions such as chronic diseases, psychological disorders and medication caused early morning awakening; 8.4% of the subjects aged 65 years and above had sleep disturbances of early morning awakening (Huang and Chou 2004). From the above findings, it becomes more evident that elderly subjects’ sleep pattern involves difficulty in initiating sleep, maintaining sleep, early morning awakening and day-time sleepiness.

**Overall Sleep Pattern Disturbances**

As per the study findings the overall sleep pattern disturbances among seniors residing in old age homes is described,
and a total score of 20 was given. The level of sleep disturbances was graded as follows:

0       - Fully disturbed
1–5     - Very severe sleep disturbance
6–10    - Severe sleep disturbance
11–15   - Moderate sleep disturbance
16–18   - Mild sleep disturbance
19–20   - Normal sleep.

Based on the above scores, the level of sleep disturbance was measured. The results depicted that out of 150 subjects, majority of them, numbering 46.67%, had severe sleep disturbance, 36% of them had moderate sleep disturbance and 8.67% of them had very severe and mild sleep disturbances. This clearly showed that almost all of the residents had some kind of sleep disturbances or the other during their stay in old age homes, but none of the subjects were found to have either fully disturbed or they had normal sleep.

When the above subjective data were compared with the perception level of sleep by using visual analogue scale developed by the researcher, the findings described that (51.33%) of the subjects perceived their sleep to be severely disturbed, 58 (38.67%) of the subjects perceived their sleep to be moderately disturbed and the rest, 10% perceived their sleep as mild sleep disturbance. It is
concluded that both the self-report on sleep pattern and their perceived level of sleep were almost equally matched. Thus, ageing is associated with several well-described changes in patterns of sleep (Wolkove, 2005).

Further, Lichstein et al. (2006) reported that the prevalence of insomnia had increased to 41% among subjects aged 70 years and above. The findings of the present study showed that out of 150 subjects 51 (34.1%) of them were in the age group of 76 years and above, which is a strong evidence that sleep is affected as age advances, due to the ageing process (Ancoli-Isreal, Kripke 1986).

The ongoing study on sleep in late life is very important for several reasons. First, elders suffer sleep disturbances (Carskadon Dement 1981, Miles and Carskadon 1982). Secondly, research can be done to study the effects which may help in improving the health and quality of life of all late life age groups. Hochstrasser (1993) in an epidemiological investigation reported that 26.2% experienced moderate to severe sleep disturbances.

The second objective was to identify the factors that caused sleep disturbances among the subjects residing in old age homes

Sleep disturbances are common in older adults and may not be due to age process alone but are often due to secondary to physical, psychological, social and environmental factors. The
present study helps to identify the factors affecting sleep pattern of
the subjects in old age homes. The author made an earnest attempt
to derive results by analysing various factors.

The various factors which contribute to the sleep disturbances
among the elderly include unfamiliar environment in old age homes
(6.6%), noise and light (18%), bedroom temperature (0%),
uncomfortable mattress (2%), irregular sleep time (6%), loss of loved
one (20%), moving away from family (28.67%), anxiety and
depression (38.6%), fear of death (12%), need to drink water (18%),
racing out of thoughts (14%), frequent need to urinate (46%), fear of
care taker (3.33%) and financial dependence (4%).

Health problems include those such as body aches and pain
(54.67%), hypertension (24.67%), diabetic neuropathy (9.33%)
night-time heart burn (7.33%), osteoporosis (3%), asthma (7.33%),
paraesthesia (4%), dust allergy (2%), Alzheimer’s disease (0.67%).
Medication history include self-medication (8.67%), medication on
prescription for diabetes (13.33%), hypertension (24.06%) and pain
(Arthritis) (7.33%), and non- medication (46%), caffeine history
(99.33%), diet history (100%) having a balanced diet and personal
hygiene (1.33%), reading (2%), watching television (63.33%),
listening to music (8%), and deep-breathing (1.33%), not doing any
physical activity (99.33%), (99.33%), not relaxing before going to
bed, sleep disorders, snoring 14%, 4% not being aware of sensation
in the legs. As 30.67% with systolic pressure between 121-130 mmHg and 36.67% with diastolic blood pressure between 71-81 mmHg and for 82% pulse rate was between 70-90 beats per minute.

Sleep disturbance score was measured between 0 (fully disturbed) and 20 (normal sleep pattern). Stepwise multiple regression analysis was used to identify the related variables to predict specific factors that caused sleep disturbances based on the selected demographic variable.

As per the results it is inferred that, among the entire list of variables the following 8 variables were identified as the most significantly related variables that caused sleep disturbance among elderly persons residing in old age homes. They were 1. pain, 2. anxiety and depression, 3. urge to urinate, 4. day-time nap, 5. noise and light, 6. personal hygiene, 7. watching television and 8. listening to music. These variables are statistically significant at p value of <0.05 levels. Multiple R square value of 0.40 indicated that 40% of the sleep disturbance was explained for the 8 variables.

A similar study conducted by Su, Huang and Chou (2004) to identify the factors which caused sleep disturbance, were nocturnal micturation (20.6%), frequent use of hypnotics (3.2%) pulmonary disease (2.4%) excessive day time sleepiness (1.8%) body pain (2.6%) depression (2.2%), the present study supports that nocturnal
micturation, excessive day time sleepiness, body pain and depression were the major cause for sleep disturbances among elderly person residing in the old age homes.

A similar study conducted by Jogindra (2011) on sleeping pattern and factors contributing the sleep disturbances among adults, the findings showed that psychological factors such as anxiety and depression were the main causes to the sleep disturbances. This study findings strongly supports the present study findings that anxiety and depression was the second most important cause reported by the subjects in the old age homes.

**Phase II**

A total of 150 subjects were selected from five old age homes based on convenience sampling technique. Selected subjects were allotted to three groups. Experimental group I consisted of 50 subjects were taught about the nursing interventions, which promotes sleep among the subjects with sleep disturbances, for 3 months. Experimental group II consisted of 50 subjects were taught progressive muscle relaxation techniques with deep breathing exercises, which promotes sleep among the subjects with sleep disturbances, for 3 months. A third group was the control group which was not exposed to any of these two interventions.
The objective was to test the effectiveness of nursing interventions within the experimental group I. Further, the objective was also to test the effectiveness of progressive muscle relaxation with deep-breathing exercises within the experimental group II and to compare the effectiveness of the above two interventions with the control group III subjects who were not exposed to any of these two intervention, after 3 months of regular practice.

Before administering the intervention, all the three groups were compared for homogeneity to participate in an experimental study. The Chi-square test results indicated that there was no significant difference among the 3 groups based on age, gender, religion, residence, activity pattern, previous occupation, previous monthly income present financial support and the duration of stay in old age homes. But it was found that there was a significant difference at P < 0.01 level, related to the marital status, general health status and their history of hospitalisation.

Hence all the three groups were competent to participate in the study.

**The third objective of the study was to test the effect of nursing interventions on sleep among elderly subjects with sleep disturbances residing in old age homes**

Sleep disturbances are the most common problem among elderly persons. The pharmacological treatment has its own side
effects. The non-pharmacological treatment used by nurses are more effective in promoting sleep among the elderly (Hundhia, Ancoli Israel (1991), Mullan and Bellow (1994), Morgan and Claws (1999), Ho and Wong et al (2002), Schneider (2002), Brain (2006), Caplin French (2006), Nabil Kamel (2006), Goddard et al., (2010) Hellstrom et al (2010)). Sleep disturbances are common among individuals staying in old age home. Several studies have explained this phenomenon. But there is lack of knowledge about the effect of nursing interventions on promoting sleep. The present study is aimed to study the effectiveness of nursing interventions in promoting sleep.

Kocha (2006) quoted that interventions such as reduction of environmental noise and promotion of day-time activity are likely to be more effective for promoting sleep. Disturbed sleep and the use of medications had reduced the quality of life. He also suggested that the effective use of interventions should be promoted and practised by nurses. For the present study the researcher incorporated the above interventions to promote sleep. This study finding was further supported by Bephage (2005). He suggested that environmental noise and light are the common factors that caused sleep pattern disturbances among elderly persons. In addition, promoting physical activity and evening time exposure to light-enhanced sleep among elderly were also likely to improve sleep patterns (Ouslander
et al (2006) Willion Simson, Cathlean Bergem et al (2007). Also authors of various books such as Potter and Perry (2007), Lewis 2005, Brunner (2005) Black (2005) have suggested nursing interventions such as maintaining a consistent bedtime and wakeup time everyday, including weekends, doing something, relaxing and enjoyable before bedtime, avoiding going to bed on a full stomach or hungry, eating a light snack before bedtime if hungry, making the bedroom as quiet and dark as possible, using the bed only for sleeping, avoiding alcohol or caffeine before 6 hours of bedtime, avoiding taking naps during the day and early evening, exercising as early in the day as possible, exercising before 3 hours of bedtime should be avoided, avoiding medications that are stimulants, not keeping the television on at night, avoiding turning on bright lights if getting out of bed at night and maintaining a comfortable temperature in the bedroom that promote sleep among subjects with sleep disturbances.

The results of this study shows the comparison of the mean sleep pattern score of the subjects in group I nursing interventions before and after 3 months of nursing interventions. The mean post-test sleep pattern score (11.840) was found to be slightly higher than the mean pre-test sleep pattern score (11.140), which showed that the results were not found to be statistically significant by using paired “t” test with P value 0.136. The researchers used
higher level of statistics, ANCOVA (Table 4.41) Bonferroni multiple comparison test (table 4.41b), which inferred that the intervention had impact on the post-test sleep pattern score. While comparing group I (nursing interventions) with the control group III (who were not exposed to any intervention), it was proved that nursing interventions was effective in promoting sleep among the elderly and was found to be significant at p<0.05. It was proved that if the subjects follow nursing interventions regularly it will be very effective in promoting sleep among elderly residing in old age homes.

Nursing research studies on sleep among elderly present a challenge for the next decade. The majority of studies on sleep and ageing have not been designed by nurses. Many nursing research studies on sleep and older adults have focused primarily on observational and subjective methodologies, such as sleep pattern among institutionalized elders (Clapin Fench 1986, Gress and Hassahein 1981) on Sleep Behavior and Routines (Colling 1983; Hayter 1983), in the theoretical and empirical analysis of sleep disturbance pattern in ageing.
The fourth objective of the study was to test the effect of progressive muscle relaxation with deep-breathing exercise after intervention among elderly residing in old age homes

The present study finding showed that the mean post-test sleep patterns scores of the subjects who practiced progressive muscle relaxation with deep breathing exercise, after 3 months was, 12.04 which was found to be higher than the mean pre-test sleep pattern score, (10.44) Paired ‘t’ test result showed significant difference with P <0.01 level. Hence it concluded that regular practice of progressive muscle relaxation with deep breathing exercise was effective in promoting sleep among the subjects residing in the old age homes.

According to Monroes (1967), insomniacs showed a heightened physiological arousal at bedtime and various therapists had made an attempt to reduce the excessive arousal through the use of progressive muscular relaxation techniques developed by Jacobson (1938).

Scientific studies have proved that progressive muscle relaxation with deep-breathing exercise is an effective treatment for sleep disturbances.

The author used modified progressive muscle relaxation with deep breathing exercises. Breathing and relaxation techniques were used to promote relaxation and to relieve stress. The deeper and the
slower the elderly breathe the more relaxed and sedated they were; the lungs were also filled with fresh air. Regular practice of this and progressive muscle relaxation with deep breathing will help the body to wind down and prepare for the sleep cycle; this exercise, progressive muscle relaxation, will make the body and mind to settle down, leaving behind thoughts of worry/fear.

Further, the present study results shown in Table 4.41b proved that while comparing the experimental group II with the control group III (who were not exposed to any of the interventions), it was significant at p<0.001 level.


Relaxation Improves Sleep

When practiced during the day, relaxation response counters daily stress responses. This reduces the likelihood that stress hormones will be elevated at night. When practiced at bedtime or after awakening, relaxation response helps turn off negative sleep thoughts, quiets the mind and relaxes the body.
Relaxation response elicits a brain-wave pattern similar to stage 1 sleep, the transition state between waking and sleeping. Thus, by practicing the relaxation techniques at bedtime or after a night-time awakening, it is easier to enter stage 1 sleep and then to stage 2, deep sleep, and dream sleep ultimately.

People who practice relaxation techniques fall back to sleep faster. They sleep longer and have a better quality of sleep (deep sleep). They are more rested in the morning. Gradually they develop a greater sense of control over their mind and sleep. Thus, although the relaxation techniques by itself may not cure insomnia, it has a significant positive effect on sleep.

**Manjunatha and Shirely (2005)** conducted a study to find out the effectiveness of relaxation techniques to promote sleep among the elderly and found that the practice of relaxation techniques had decreased physiological arousal.

**Meiner and Luekenotte (2006)** used relaxation techniques to promote sleep among elderly subjects. A person at rest is in a state of being physically and mentally relaxed, free from the anxiety of being awake and alert.

A subject with insomnia has increased sympathetic nervous system tone. Relaxation may help decrease the tone and thus
promote sleep. Progressive muscle relaxation and deep breathing may prove beneficial (Harkreader, Hogan and Thobaben 2007).

Exercise programmes of 20-60 minutes 3 to 4 times a week is helpful in promoting sleep among elderly. The elderly persons must be encouraged to make the practice of relaxation techniques at bedtime as a daily routine in their schedule. Therefore emphasis relaxation techniques as a component of lifestyle. It should not be used as a short-term cure for sleep disturbances.

The present study results also suggested that relaxation techniques which include progressive muscle relaxation with deep breathing exercise had improved the overall sleep pattern score among the institutionalized older person. Since it is known that changes in sleep are inevitable as age advances (Vitello 2000) an intervention, which makes the process free from difficulties, is a useful addition to the routine of an older person.

While comparing the pre-test and post-test sleep pattern when the control group III (who were not exposed to any intervention), the results showed that the post-test sleep pattern score (9.02) remains same as that of the pre-test sleep pattern score (8.96) which was found to be insignificant with P value .554. Hence, it is concluded that the sleep pattern remains same among the subjects in the centre group III.
The fifth objective was to compare the two experimental groups I and II with the control group III

While comparing the pre-test sleep pattern score of the subjects in experimental I, II and control group III, the pretest average sleep pattern score was found to be 11.14 in experimental group I, 10.44 in experimental group II and 8.96 in the control group III. One-way ANOVA test has been applied to compare the three means. It indicated that the sleep disturbances differ among the three groups even before administering intervention.

Hence, Scheffe’s multiple comparison test has been applied to find out which group differs. The results indicated that all the three groups differ significantly at P<0.01 level. The subjects in the experimental group I had less sleep disturbances before administration of intervention. When compared with experimental II and the control group III Most of them felt refreshed after sleep and the setting of the study subjects those who belonged to the experimental group I were the inmates of old age home run by the non-governmental organization and by the Christian missionaries and the old age home had provided adequate facility for the elderly, there is a full time staff nurse appointed to look after the subjects, also regular activities are motivated and regular physical examination were conducted by the physiotherapist. Though the results were statistically insignificant among the subjects who
practiced nursing interventions, it was insured that nursing interventions is effective in promoting sleep among the subjects with ANCOVA results. ANCOVA results indicated that after the intervention, the experimental group II had less sleep disturbances, compared to the experimental group I and control group III. Further nursing interventions group had less sleep disturbances, compared to the control group III. Further it was also inferred that the post-test score on sleep pattern mainly depended on the interventions and not on any other demographic variables and the factors that caused sleep disturbances.

Finally when the experimental group I compared with the experimental group II, the results inferred that there is no significant difference between the two experimental groups with the P value as 1.00. This has proved both the nursing interventions and relaxation techniques such as progressive muscle relaxation with deep breathing exercise were effective in promoting sleep among the subjects residing in old age homes.

While comparing the perception level of sleep among the subjects in 3 groups, the results indicated that the subjects in the experimental group I perceived less sleep disturbances when compared with the experimental group II; further, the subjects in the experimental group II perceived less sleep disturbances when compared with the control group III, before intervention. But after 3
months of intervention their perception of sleep remained same among the subjects in the control group III whereas the subjects in the experimental group II perceived less sleep disturbances than the subjects experimental group I.

Various literatures had suggested that sleep disturbances are common as a consequence of old age (Ancoli-Israel 2005), and in addition sleep disturbances were caused by medical and psychological problems. The present study findings provide evidence that for all the above-mentioned problems related to sleep pattern, regular practice of progressive muscle relaxation with deep breathing exercise was very effective in promoting sleep. Nursing interventions were also effective in promoting sleep among the elderly residing in old age homes. When the two groups were compared with the control group III, there was no change in the subjects’ sleep pattern in the control group III. Therefore, it is concluded that nursing interventions and progress muscle relaxation with deep breathing exercise were effective in promoting sleep among elderly in old age homes. Out of these two interventions progressive muscle relaxation with deep breathing exercise was better than nursing interventions. But both the interventions was effective in promoting sleep among elderly residing in the old age home.

“Let’s add life to elderly
Let us add years to their life”