Chapter I

INTRODUCTION

“India is currently entering the age of ageing,
Let’s add life to their years”

Ageing is a natural, universal and an inevitable developmental phenomenon which takes place even with the best nutrition and health care.

Demographic ageing is a global phenomenon. By the year 2025, the population of elderly is expected to exceed 830 million. As per the 1951 census, the population of the elderly people in India was 20 million and increased to 57 million in 1991, and in 2001 it was 77 million. The population of the elderly is expected to increase by 177 million by the year 2025. The number of elderly people may exceed 324 million by the year 2050 (O.P. Sharma, National Conference in Geriatrics and Gerontology, 2005).

A majority of the aged population are both in rural (50.78%) and in urban (57.35%) areas. They depend totally on others for economic support. However, with the rapid industrialization, urbanization and disintegration of the traditional joint family system, the people in India are likely to face major social problems
Nowadays most of the younger generation migrate to distant places seeking jobs and settle far away from their native places. Owing to this, the elderly are left behind and sometimes are even abandoned. Due to socio-economic reasons, some members of the younger generation are unable to take care of their decrepit parents. Inadequate living space is one of the reasons for this. Some of the younger generation perceive the elderly as burdensome. At the same time the aged themselves do not want to be a burden to their family. As a result, they are forced to join old age homes.

As the age progresses towards senility, they experience a number of psycho-physiological problems. As a consequence of these problems, they often suffer from sleeplessness. According to the National Sleep Foundation (2003), 44% of aged persons do not sleep well and they experience at least one or more symptoms of sleep disturbances.

Sleep disturbances are the most common complaints of these people. No perfect medicine has been found so far to cure this problem. Thus, no doubt, it is undiagnosed and untreated among many of the elderly persons (Mazza M, et al., 2004).

More than 50% of the aged people suffer from sleep disturbances and non-pharmacological interventions are found to
be underused by health-care providers for sleep problems (Division of Geriatric Medicine, USA, 2005).

Shantham Lillypet (2006) conducted a study based on this problem and stated that 52.5% of the elderly perceived sleep as their third important need.

Sleep pattern disturbance in the elderly persons: Sleep onset latency is the persistent difficulty in sleep initiation. The elderly find it difficult to initiate sleep or need prolonged time to fall asleep; for instance, if they go to sleep they don’t fall asleep immediately. Sleep initiation duration may extend for more than 30 minutes; it can even, sometimes, extend to more than two hours. If they go to bed at 9 o’clock in the night, they may fall asleep only by 11 p.m. or 12 at midnight.

Sleep fragmentation: This can also affect the sleep of aged persons. People frequently wake up from sleep because of several causes and they experience difficulty in continuing or sustaining sleep. The common causes which wake them up at night are thirst, worries, fear of care taker, fear of death, etc. Some elderly who wake up at midnight experience difficulty going back to bed, and thus falling asleep. Thus they do not sleep even till 3 a.m. (i.e. hardly 2 to 3 hours of uninterrupted sleep). They may fall asleep again only during the early morning hours. Sometimes they may wake up at
12 midnight and may keep awake till 3 or 4 a.m. in the morning and then sleep until 7 a.m.

**Terminal insomnia:** Aged persons wake up early in the morning, that is before 4 a.m. and remain inactive during the daytime due to lack of proper sleep at night.

Many people prefer **day-time sleep**, because they do not have a wink of sleep during the night time. They may nap in the morning after taking breakfast and experience proper sleep between lunch and dinner.

The duration of sleep for older adults is about 6 hours at night. While considering the **stages of sleep**, older adults usually have about 20 to 25 percent of Rapid Eye Movement sleep. Stage IV of Non-Rapid Eye Movement is markedly decreased or in some instances completely absent. As a result of the change in stage IV sleep, older adults have less restorative sleep.

**Circadian Rhythm Disturbances** can affect the sleep of aged persons. Sometimes Circadian Rhythm disturbances may lead to early evening and early morning sleepiness. All these changes cause disturbances in the quality of sleep and not in the quantity of sleep (hours).
Sleep disturbances in the aged may not be due to the ageing process, instead they are likely to be caused by various factors that may contribute to sleep-related problems. Among them some cases can be cured with treatment.

Some of the medical problems causing sleep disturbances are pain, arthritis, diabetic neuropathy (burning foot pain), frequent need to urinate, nighttime heart burn, osteoporosis, menopause, asthma, paresthesia (numbness and tingling sensation of the extremities), dust allergy and Alzheimer’s disease. These symptoms wake them up frequently and cause difficulty in maintaining sleep and ultimately shorten the duration of sleep.

Psychological distress, such as anxiety, depression, and significant life changes, such as the death of a beloved one, moving from a family or home, or physical constraints due to illness, can cause stress and lead to disturbances in the sleep pattern of the elderly.

Poor sleep habits are developed due to consumption of coffee and alcohol before bed time. Day-time nap can cause difficulty in initiating sleep and these factors can also affect the quality of sleep.

Most of the elderly persons use medications for their physical illness. Certain medications may impair their ability to sleep and are even proved to stimulate wakefulness at night.
Reduced physical activity in the elderly people can lead to many medical illnesses which in turn can affect their sleep.

Other factors that cause sleep disturbances include a high prevalence of specific sleep disorders such as sleep apnea and Periodic Limb Movements (PLMS).

As a consequence, the sleep pattern disturbances in the elderly persons can lead to increased risk of falls, difficulty in sustaining attention, difficulty in memory, disorientation and daytime sleepiness. Psychomotor retardation can lead to decreased performance, slowed response time, reduced quality of life, fatigue, loss of energy, depression and anxiety, waking up with dry mouth and morning headaches.

An accurate diagnosis of sleep disturbances and non-pharmacological interventions may help in reducing geriatric morbidity and mortality, and this will certainly improve the quality of life of the elderly persons.

**NEED FOR THE STUDY**

*Grandjean and Gibbons (2000)* investigated that sleep disturbances affect more than 50% of men and women over the age of 65 years.
Results from different studies suggest that there is a higher prevalence of insomnia among the elderly patients in old age homes. It ranges from 18% to 48%, but there is inadequate literature to support the data. This leads to lack of identification or misdiagnosis of sleep disturbances among the elderly residing in old age homes.

An observational study of 145 older patients (aged 65–104 years) living in old age homes in Massachusetts found that 65% had one or more sleep-related complaints.

Interestingly, a Dutch study of 160 non-demented institutional elderly reported an association between higher level of institutionalism and phase-advanced sleep-wake patterns. Prolonged time spent in bed each day increased the risk of sedative or hypnotic medications.

Most of the aged persons use benzodiazepines and hypnotics to induce sleep. Constant use of these drugs may cause increased risk of falls, excessive day-time sleepiness, confusion and decline in functional status.

Some of the currently used non-pharmacological interventions to improve sleep are relaxation techniques such as progressive relaxation, toe tensing, deep-breathing exercises, guided imagery and quiet ears (University of Maryland Medical Center, 2005).
Nursing research studies on sleep and older persons present a challenge for the next decade. Majority of sleep and ageing research studies that have been conducted are not designed by the nurses. Nursing research studies on sleep among the older adults have focused primarily on subjective methodologies such as sleep patterns among the institutionalized elderly persons (Caplin, French, 1986; Gress, Bahr and Hassahein, 1981). More researches are needed to delineate specific assessment parameters and intervention techniques.

Further, one of the most important responsibilities of a nurse is to promote a conducive environment for the elderly people to sleep. There are studies which suggest that it is necessary to promote nursing interventions and non-pharmacological interventions like relaxation techniques to promote sleep.

Investigators’ experience of working with the elderly persons revealed that those who are suffering from diabetes mellitus with burning foot and hypertension during old age reported to be suffering from sleep disturbances at night even though they were on medication. Whereas other aged persons who regularly exercise and take a daily walk, along with intake of their regular medications, do not experience any sleep disturbances. As nursing personnel, the investigator is interested in eliciting the importance of nursing care and relaxation techniques such as progressive muscle relaxation
and deep breathing exercises in improving the sleep pattern of the subjects.

STATEMENT OF THE PROBLEM

A Quasi Experimental Study to Assess the Effectiveness of Nursing Interventions and Relaxation Techniques on Sleep among the Senior Citizens Residing in Old Age Homes at Puducherry.

OBJECTIVES

1. To study the sleep patterns and disturbances that arise during sleep among the subjects residing in old age homes.

2. To identify the various factors that cause sleep disturbances among subjects residing in old age homes.

3. To assess the effectiveness of nursing interventions on sleep after such interventions among subjects residing in old age homes.

4. To determine the effectiveness of progressive muscle relaxation techniques with deep breathing exercises on sleep after such intervention among subjects residing in old age homes.

5. To study the comparative effectiveness of the interventions on sleep among experimental group I (nursing interventions), experimental group II (progressive muscle relaxation techniques with deep-breathing exercises) and control group III (without any intervention) residing in old age homes post-test.
HYPOTHESES

In consonance of the above objectives the following hypotheses are formulated:

\( H_1 \) : There is a significant difference in the sleep pattern among the subjects before and after the nursing interventions.

\( H_2 \) : There is a significant difference in the sleep pattern among the subjects before and after administering relaxation techniques such as progressive muscle relaxation with deep breathing exercise.

\( H_3 \) : There is a significant difference in the mean score of sleep pattern among the subjects exposed to nursing interventions in the experimental group I, subjects exposed to relaxation techniques in experimental group II than the subjects who were not exposed to any intervention in the control group III.

ASSUMPTIONS

1. Nursing interventions will help the subjects to have better sleep.

2. Relaxation techniques will be an effective method for promoting sleep among the subjects residing in old age homes.
OPERATIONAL DEFINITIONS

1. Effectiveness

Effectiveness means the desired change brought out in the sleep pattern, sleep disturbances and their perceived level of sleep by nursing interventions and relaxation techniques among the senior citizens residing in old age homes. It is measured in terms of significant change in the sleep pattern and sleep disturbances by using sleep pattern assessment questionnaire and by assessing their perceived level of sleep with the help of visual analogue scale for sleep developed by the researcher.

2. Nursing interventions

It refers to certain techniques administered by a nurse to a subject with sleeping problems, which include:

1. Encouraging the subjects to keep themselves active during the day by practicing a range of motion exercises at the joints.

2. Discouraging the subjects from drinking water or any other fluids right before going to bed in order to avoid nocturia.

3. Advising the elderly subjects to avoid sleeping with full stomach; and thus ensuring they avoid intake of food/water at least two or three hours before bedtime.
4. Insisting that the subjects refrain from using stimulants such as coffee, tobacco, etc. at least 4–5 hours before going to bed.

5. Advising the elderly subjects to not lie awake for more than 30 minutes in bed, and to do something quiet and non-stimulating. For example, reading spiritual books.

6. Providing the subjects with a conducive environment. For example, providing a dull-lit room with proper ventilation, fresh air, optimal room temperature and a comfortable bed.

7. Encouraging bed-time rituals like maintaining personal hygiene, practicing deep breathing exercises and relaxing before bedtime.

8. Helping to maintain a regular schedule which also includes following a time to wake up, eat and go to bed.

The subjects should be habituated to practice the above guidelines to promote sound sleep.

3. Relaxation techniques

These include modified Jacobson’s progressive muscle relaxation techniques and deep breathing exercises.

1. **Progressive muscle relaxation:** It refers to lying in “Supine position” with hands and palms facing upwards. It involves the systematic contraction and relaxation of specific group of muscles, starting from lower extremities, buttocks, abdomen, chest, upper
extremities, neck and the face in which the subjects completely tense all the muscles and contract for 20 seconds, and relax for 40 seconds, until every part has been relaxed.

2. **Deep-breathing exercises:** Taking a breath, through the nose, and to feel the movement of the stomach rise up by placing your hands on the stomach for a count of four and to hold it for a count of four followed by breathing out through pursed lip for a count of eight. This has to be repeated 6 to 10 times.

4. **Senior citizens**

   In this study senior citizens include all the elderly persons above 60 years of age residing in old age homes.

5. **Sleep Pattern among elderly persons**

   The elderly describe their sleep as refreshing and the quality of sleep as extremely good with initiation of sleep within 30 minutes. Out of 7 hours in the bed elderly people sleep for at least for 5 hours without any disturbance. Even disturbed aged persons get back to sleep without trouble and wake up between 4 and 5 a.m. in the morning.

6. **Old age home**

   Old age home refers to a residential place in which the elderly people are admitted and taken care of. These are located in and around Puducherry.
DELIMITATIONS

1. The study is limited to subjects with sleep disturbances residing at old age homes in Puducherry.

2. Subjects are observed only for a period of 3 months.

CONCEPTUAL FRAMEWORK

Conceptual framework refers to the inter-related concepts or abstractions that are assembled together in some rational scheme by virtue of their relevance to a common theme (Polit and Hungler 2007). The conceptual framework in this study is based on Roy’s adaptation model. It is a complex nursing model that postulates that human beings have the ability to adapt to change in the environment, and this adaptation is through maintaining 4 sub-systems.

1. Physiologic needs
2. Self-concept
3. Interdependence
4. Role function.

For nursing, the goal is to use this model to guide health promotion and adaptation to illness. This model postulates that focal stimuli, contextual stimuli and residual stimuli can be manipulated to promote adaptation.
Adaptation responses can be effective or ineffective depending on the mode of adaptation. Effective adaptation responses are brought to promote integrity of the human system. Sleep can be conceptuated as a physiological mode of adaptation, alone or in combination with other outcomes.

The investigator used Roy’s adaptation theory. The main concept of this model is input, throughput, output and feedback.

**Input**

Input is the information needed in the system; that is pre-test assessment of demographic data as focal stimuli, assessment of factors causing sleep disturbances as a residual stimuli and assessment of sleep pattern, sleep disturbances and their perceived level of sleep as contextual stimuli.

**Control Process or throughput**

Throughput is the activity phase. It is a process that allows the input to be changed. The cognator group I is administered nursing interventions, such as physical activity, avoiding drinking water or any other fluids before going to bed, avoiding sleeping with full stomach, avoiding stimulants, doing something quiet and non-stimulating, providing a conducive environment with dull lighting without noise, encouraging bed-time rituals, maintaining regular schedule for waking up, eating and going to bed. For the
experimental group II, teaching relaxation techniques such as progressive muscle relaxation and deep breathing exercises were administered; and the third group, the control group, was not exposed to any such interventions. The effectiveness of nursing interventions and relaxation techniques was assessed after 3 months to regulate the sleep pattern among the elderly residing in old age homes.

**Output**

Roy had stated the output of the system as an adaptive response or non-adaptive response. The information is continuously processed through the system and released as an output in an altered state; that is a post-test assessment was done to find out the changes in the sleep pattern, and to study whether nursing interventions were effective in promoting sleep, or progressive muscle relaxation exercises with deep breathing exercises were effective in promoting the desired sleep pattern among subjects when compared with the control group III, which was not exposed to any intervention.

**Feedback**

The feedback was the change in the sleep pattern influenced by the nursing interventions and relaxation techniques such as progressive muscle relaxation with deep breathing exercises.