Assessment of quality of sleep among patients with Parkinson's disease at tertiary care center, Tirupati, AP.

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Surgical Nursing, SVIMS, Tirupati, India.

Abstract: A study to assess the quality of sleep among patients with Parkinson's disease attending neurology OPD, SVIMS, Tirupati.

Objectives: To assess the quality of sleep among Parkinson's disease patients, to find out the association between quality of sleep with selected demographic variables among Parkinson's disease patients. Parkinson's disease (PD) is the second most common neurodegenerative disease affecting 1% of people over the age group of 65 years. Incidence of PD increases with age.

Methodology: Cross–sectional descriptive design was used. Independent variables were Parkinson's disease patients and Dependent variables were Quality of sleep. The study was conducted at neurology OPD, SVIMS, Tirupati. A total of 110 PD patients who fall under inclusion criteria by using non probability purposive sampling technique were selected. Sleep quality was assessed by using Parkinson's disease sleep scale (PDSS-2). Reliability was done by Cronbachs alpha r=0.83,Stability with intra class correlation co-efficient r=0.895%.Chi square & One way ANOVA were applied to test the hypothesis.

Results: The study findings revealed 1.8% has mild sleep disturbances, 8.2% have moderate sleep disturbances and 90% have severe sleep disturbances. The mean total Parkinson's disease sleep scale score was 49.72 ± 8.057. Age, marital status, education, occupation and habit of sleeping day time were shown significant association with quality of sleep (p< 0.01).

Conclusion: It was concluded that there was severe sleep disturbances among the respondents of the present study which shows that patients with PD has inadequate knowledge about the disease symptoms and their management, which affect the quality of sleep.

Keywords: Parkinson's disease (PD), Parkinson's disease sleep scale(PDSS), Quality of sleep.

I. Introduction

1.1 Back Ground Of The Study

Parkinson's disease is the second most common neurodegenerative disease affecting 1% of people over the age group of 65 years. Parkinson's disease is a chronic, slow, progressive neurologic movement disorder caused by loss of dopaminergic neurons in the substantia nigra of the basal ganglia. It produces movement symptoms such as tremor, rigidity, bradykinesia/akinesia and postural instability. Furthermore, non-motor symptoms including autonomic dysfunction, cognitive impairment, mood disorders and specially sleep problems are frequent. Sleep disorders are commonly presented in patients with Parkinson's disease and other neurodegenerative disease. Parkinson's disease causes significant disability and decreased quality of life. [1]

Sleep disturbances are common problems in patients with Parkinson's disease caused by various factors including nocturnal motor symptoms, psychiatric symptoms, dementia, medication use and circadian cycle disruptions as well as co morbidity with sleep apnea syndrome, restless legs syndrome and rapid eye movement sleep behavior disorder. As impaired sleep quality and sleep fragmentation due to night time problems are associated with daytime motor dysfunction and have a negative impact on the quality of life of the patient. Impaired sleep architecture and sleep-wakefulness systems are observed in Parkinson's disease as disease related changes. [2]

Insomnia in patients with the early stage of disease or in untreated patients may be associated with disease-related sleep disturbances rather than sleep disturbances caused by other factors including motor dysfunction, medication use, neuropsychiatric symptoms and cognitive dysfunction, though non-motor symptoms can occur in the early phase of the disease. Serotonin, acetylcholine and noradrenalin play a role in maintaining wakefulness and thus, disturbances lead to excessive daytime sleepiness. Loss of orexinergic neurons in the posterior portion of the lateral hypothalamus and the reduction of the A10 dopaminergic group in the ventral tegmental area have also been implicated in impaired wakefulness in Parkinson's disease.[2]

Dopamine has a role in regulating the sleep-wake cycle. High doses of D2 agonists reduce slow-wave sleep and REM sleep and increase wakefulness mediated through postsynaptic receptors, whereas low doses of D2 stimulants increase slow wave sleep and induce sleep mediated through presynaptic receptors. A D1 receptor agonist suppresses the amount of REM sleep in dose-dependent manner and enhanced wakefulness, while D1 antagonists increase REM sleep. Nocturnal disturbances have been reported in up to 98% of patients with Parkinson's disease. Disturbances include rigidity, tremor, dystonia, akinesia, nightmares, hallucinations, muscle cramps and nocturia. These symptoms result in frequent nocturnal awakenings that contribute to sleep maintenance insomnia, a common form of insomnia in Parkinson's disease.[2]

1.2 Need For The Study

Sleep problems are a fact of life for nearly 80 % of people with Parkinson's disease. A recent nationwide survey conducted by National Parkinson foundation (NPF) revealed 60 % of Americans were experiencing consistent regular tremors, most of those surveyed (81%) recognized that tremors are an early warning sign of Parkinson disease. Although men suffer from Parkinson's 1.5-2 times more than females. [3]

Insomnia and hypersomnia occur frequently in the general population and increase with higher age. Poor nighttime sleep is associated with lower quality of life of patients and their spouses, while excessive daytime sleepiness may be bothersome or even dangerous. [4]One billion people on the planet will be over the age of 65 years. Approximately 1% of people aged 65 to 69 years suffer from Parkinson disease, the prevalence increases to nearly 5% among people aged 80 to 84 years. Elisabeth Svensson et.al, have reported that about 60% of Parkinson's disease patients had a sleep disorder compared to 33% of the controls. [5]

Incidence of Parkinson's disease increases with age. It is thought that around one in 500 people are affected by Parkinson's disease and it is estimated as 1,27,000 people in the UK affected with Parkinson's disease. Most people with Parkinson's start to develop symptoms when they are over 50 years, although around one in 20 people with the condition first experience symptoms when they are less than 40 years. [6]There were an estimated 4.1 million people worldwide with Parkinson's disease in 2005. In 25 years, that number is predicted to climb to 8.7 million. [7]

Many of the non-motor aspects of Parkinson disease such as sleep disturbance are more common and significantly affect the day-to-day activities of patients and their quality of life. [1]The main factors responsible for disturbed sleep in Parkinson disease have been classified into the following four subcategories. [8]

- Parkinson disease related motor symptoms, including nocturnal akinesia, early-morning dystonia, painful cramps, tremor and difficulty turning in bed.
- Treatment related nocturnal disturbances with drugs like levodopa, other dopamine agonists and antidepressants.
- Psychiatric symptoms, including hallucinations, vivid dreams, depression, dementia, insomnia, psychosis and panic attacks.
- Other sleep disorders, including insomnia, rapid eye movement behavioural disorder, restless legs syndrome, periodic leg movements and excessive daytime sleepiness. Other common problems among these patients like poor sleep hygiene, nocturia and pain further worsen sleep quality.

1.3 Objectives
- To assess the quality of sleep among Parkinson's disease patients.
- To find out the association between quality of sleep with selected demographic variables among Parkinson's disease patients.

1.4 Null Hypothesis
$H_0 1$: There is no significant difference in the quality of sleep among Parkinson's disease patients.
$H_0 2$: There is no significant association between quality of sleep among parkinson's disease patients with selected demographic variables.

1.5 Assumptions
- Parkinson's disease patients will have varying levels of sleep disturbances due to impact of disease.
- The selected demographic variables have influence on quality of sleep.

1.6 Projected outcomes:
- The results of the study will help the nurse to know quality of sleep among Parkinson's disease patients.
- Findings of the study will help the patients to identify the sleep disturbances and measures to be taken for reducing sleep disturbances.

1.7. Conceptual frame work:
   The conceptual frame work for the present study was adopted from Elizabeth Lenz theory of unpleasant symptoms, 1997. The theory was based on the premise that there are commonalities in experiencing different symptoms among different groups and in different situations. The purpose of the theory of unpleasant symptoms is to improve understanding of the symptoms experience in various contexts and to provide information useful for designing effective means to prevent and manage unpleasant symptoms and their negative effects. Theory has three major components. [9] (Fig no.1)
1. The symptoms that influence the individual is experiencing
2. Influencing factors that produce or affect the nature of the symptoms experience and
3. The consequences of the symptoms experience

II. Materials And Methods
2.1 Research design : Cross–sectional descriptive design.
2.2 Setting   : The study was conducted at neurology OPD, SVIMS, Tirupati.
2.3 Population   : The population includes all Parkinson's disease patients.
2.4 Sample   : Parkinson's disease patients attending neurology OPD, SVIMS, Tirupati.
2.5 Sample size : Sample size consists of 110 patients who fall under inclusion criteria.
2.6 Sampling technique: Non probability purposive sampling technique was adopted based on inclusion criteria.

2.7 Criteria for sample selection:
Inclusion criteria: Patient's who are,
- Suffering with Parkinson's disease and between 50-75yrs of age
- Available and willing to participate in the study.
Exclusion criteria: Patient's who are,
- Suffering with other neurological diseases like stroke, epilepsy, GB syndrome etc.
- Hospitalised and could not complete the instrument due to blindness and hearing impairment.

2.8 Instrument:
Section-I: Consists of questions to collect demographic data.
Section-II: Parkinson's Disease Sleep Scale- 2 (2010)

2.9 Score interpretation:
- Mild Sleep disturbances   - Less than 20
- Moderate Sleep disturbances   - 21 – 40
- Severe Sleep disturbances   - More than 41

2.10 Validity and reliability:
   Content validity was obtained from eleven experts, includes neurologists, psychologist and experts from nursing department. Reliability of instrument was established by administering the tool to 20 Parkinson's disease patients who were not included in the pilot study and who fulfilled the inclusion criteria. Internal consistency of the tool was established by **inter rated reliability** method by using **Cronbachs alpha r=0.83.** Stability (reproducibility) was established by **test - retest** method with **intra class correlation coefficient r = 0.8 95% CI (0.707-0.924).** The tool was found to be reliable.

2.11 Method of data collection:
   A validated structured interview method was adapted to assess the quality of sleep among Parkinson's disease patients. Since the subjects were a combination of literates and illiterates therefore structured interview method was used.

2.12 Plan for data analysis:
   It was planned to analyze the data by using descriptive and inferential statistics.

Descriptive statistics were used to find out:
- Frequency and percentage distribution for demographic variables.
- Mean and standard deviation for demographic variables, PDSS domains and PDSS total score
- Item analysis to assess the quality of sleep among Parkinson's disease patients.

Inferential statistics were used to find out:

- Chi-square test to know the association between demographic variables with quality of sleep among Parkinson's disease patients.
- One way ANOVA to determine the mean variances between the demographic variables with quality of sleep among Parkinson's disease patients.

2.13 Ethical considerations:

The study was conducted by the approval of scientific research ethics committee, faculty of nursing, SVIMS University. Participants were given explanation about the purpose of the study and they were also informed that they could withdraw from the study at any time before the completion of the study. Participants who agreed to complete the study were asked to sign a consent form. Confidentiality of participants was assured and the data were accessed only by the investigator involved in the study.

III. Results

The results shows that with respect to age 59.1% (65) were in the age group of 54-67 years, 66.4% (73) were males, 94.5% (104) belong to Hindu religion, 44.5% (49) living in rural area, 78.2% (86) were married, 82.8% (97) belongs to nuclear family, 15.5% (17) has family history of Parkinson's disease, among them 14.5% (16) were parents, 56.4% (62) were illiterate, 42.7% (47) were farmers,45.5% family income is between Rs.1000 – 5000, 93.6% had habit of sleeping day time and 52.7% were slept for one hour. (Table:1)

1.8% (2) were having mild sleep disturbances, 8.2 %(9) were having moderate sleep disturbances and 90% (99) were having severe sleep disturbances. (Fig no.2)

With regard to domains of quality of sleep, it shows that 3.6% (4) have mild sleep disturbances, 20% (22) have moderate sleep disturbances and 76.4% (84) have severe sleep disturbances with motor symptoms. With regard to Parkinson's disease symptoms 2.7% (3) have mild sleep disturbances, 34.5% (38) have moderate sleep disturbances and 62.7% (69) have severe sleep disturbances. Related to domain disturbed sleep 1.8% (2) have mild sleep disturbances, 4.5% (5) have moderate sleep disturbances and 93.6% (103) have severe sleep disturbances. (Table: 2)

The mean score for motor symptoms was 16.12 ± 3.455, Parkinson's disease symptoms was $15.45 \pm 3.281$and for disturbed sleep was 18.15 ± 2.506. The mean total Parkinson's disease sleep scale score was 49.72 ± 8.057. (Table: 3)

Item analysis shows that very often ,34.5% (38)were having restlessness of legs, 33.6% (37) believed that their sleep disturbance was due to an urge to move their legs or arms, 65.5% (72) suffered from distressing dreams at night, 81.8% (90) had wake up early in the morning with painful posturing of arms and legs, 74.5% (82) experience tremors on waking up very often, 31.8% (35) were sometimes only suffers from distressing hallucinations at night, 72.7% (80)very often felt uncomfortable at night to turn around in bed or move due to immobility, 86.4% (95) were felt pain in their arms or legs, 85.5% (94) had muscle cramps, 38.2% (42) woke up at night due to snoring or difficulties with breathing very often, 74.5% (82) never slept well during last week, 87.3% (96) having difficulty of falling asleep each night and 87.3% (96) very often having difficulty of staying asleep, 45.5% (50) were often get up at night to pass urine and 84.5% (93) were felt tired and sleepy after waking up in the morning.(Table: 4)

The association of demographic variable with quality of sleep among Parkinson's disease patients shows that Age, marital status, education, occupation and habit of sleeping day time were shown significant association with quality of sleep at $p< 0.01$ and remaining variables were not found any significant association with quality of sleep. (Table: 5),In comparison of mean variance of demographic variables with quality of sleep among PD patients, the results shows that age and educational status were found significant at $p< 0.01$ level, habit of daytime sleeping were found significant at $p< 0.05$ level. (Table: 6)

IV. Discussion

Parkinson's disease is a leading progressive neurodegenerative disease, with prevalence estimated 1-2% of the population above 55 years. Sleep related disturbances are frequent in this population and in some cases it may be the initial manifestation of the disease. [10]

The first objective of the study was to assess the quality of sleep among Parkinson's disease patients. The present study findings revealed that, 1.8% (2) has mild sleep disturbances, 8.2% (9) have moderate sleep disturbances and 90% (99) have severe sleep disturbances. The mean total Parkinson's disease sleep scale score was 49.72 ± 8.057.

In Iran among patients with Parkinson's disease the mean total Parkinson's disease sleep scale score in patient group was 55.29 ± 26.92, indicating moderate to severe sleep disturbances, whereas the mean total score in control group was 20.34 ± 10.65. [1]

So, the null hypothesis $H_0 1$ states that, there is no significant difference in the quality of sleep among Parkinson's disease patients was rejected.

The second objective of the study was to find out the association between quality of sleep with selected demographic variables among Parkinson's disease patients. The results have shown that age, marital status, education, occupation and habit of sleeping day time were shown significant association with quality of sleep at $p < 0.01$. In comparison of mean variances of demographic variables with quality of sleep among patients with parkinson's disease revealed that age& educational status were found significant at $p < 0.01$ level, habit of sleeping daytime were found significant at $p < 0.05$ level.

In USA, among patients with Parkinson's disease age, gender were found to be significant at $p < 0.01$ level and disease duration were found significant at $p < 0.05$ level. [11]

So, the null hypothesis $H_0 2$ states that there is no significant association between quality of sleep among Parkinson's disease patients with selected demographic variables was rejected.

V. Conclusion

It was concluded that there was severe sleep disturbances among the respondents of the present study which shows that patients with Parkinson's disease has inadequate knowledge about the disease symptoms and their management which affect the quality of sleep.

5.1 Nursing Implications:
* Nurses should encourage the patients with Parkinson's disease to practice some tips for getting good night's rest.
* Educate the patients on the drug Levodopa, which should not be taken with high-protein meals as it reduces absorption and availability.
* Caution the patients to avoid foods and supplements high in pyridoxine (vitamin B6) which can inhibit the drug's action.
* Nurses should help the patient and family to cope with Parkinson's disease, direct them to available resources, such as support groups and PD organizations.
* The nursing administrators must organize a counselling session at OPD on warning signs, sleep disturbances and their management for people with Parkinson's disease and their families at the arrival of diagnosis.
* Organize Parkinson's disease day on April 11 with the specialized nurses in the field of neurology to acquire new knowledge regarding Parkinson's disease.

5.2 Recommendations:
* A community based study can be conducted among people with Parkinson's disease.
* A longitudinal study can be done to assess the quality of sleep among patients with Parkinson's disease.

Acknowledgement

Tables and Figures

Table-1: Frequency and percentage distribution of demographic variables among Parkinson's disease patients
(n=110)

SL.No	Demographic variables	Frequency(f)	Percentage (%)
1	**Age in years** 26-39 40-53 54-67 68-80	5 27 65 13	4.5 24.5 59.1 11.8
2	**Sex** Male Female	73 37	66.4 33.6
3	**Religion** Hindu Muslim	104 06	94.5 5.5

		Christian	00	00
4	**Place of residence** Rural Semi urban Urban		49 15 46	44.5 13.6 41.8
5	**Marital status** Married Unmarried Widow/widower Divorced Separated		86 1 23 0 0	78.2 0.9 20.9 0 0
6	**Type of family** Nuclear Joint Extended		97 12 1	88.2 10.9 0.9
7	**Family history of Parkinson's disease** Yes No		17 93	15.5 84.5
8	**If yes relationship with the patient** Parents Grandparents Siblings Others		16 1 0 0	14.5 0.9 0 0
9	**Educational status** Illiterate Primary education Secondary education Intermediate Graduate Post graduate		62 23 18 02 05 0	56.4 20.9 16.4 1.8 4.5 0
10	**Occupation** Unemployed Daily wage earner Farmer Business Private job Government job		23 3 47 17 9 11	20.9 2.7 42.7 15.5 8.2 10.0
11	**Annual income in rupees** 1000-5,000/- 5,0001-10,000/- 10,001-15,000/- 15,001-20,000/-		50 38 12 10	45.5 34.5 10.9 09.1
12	**Habit of sleeping daytime** Yes No		103 07	93.6 6.4
13	**If yes, hours of sleep** 1 2 3		58 44 1	52.7 40.0 0.9

Table-2: Frequency and percentage distribution of domains of quality of sleep among Parkinson's disease patients.

(n=110)

Sl No	Domains	Mild		Moderate		Severe	
		F	%	f	%	F	%
1.	Motor symptoms	4	3.6	22	20.0	84	76.4
2.	Parkinson's Disease symptoms	3	2.7	38	34.5	69	62.7
3.	Disturbed sleep	2	1.8	5	4.5	103	93.6

Table-3: Mean and standard deviation for domains of quality of sleep and total PDSS score among Parkinson's disease patients.

(n=110)

S.NO.	Domains	Mean	Standard Deviation
1.	Motor symptoms	16.12	3.455
2.	Parkinson's disease symptoms	15.45	3.281
3.	Disturbed sleep	18.15	2.506
4.	Parkinson's disease sleep scale score	49.72	8.057

Table-4: Item wise analysis on quality of sleep among Parkinson's disease patients

(n=110)

Sl. no.	Quality of sleep	Never		Occasionally		Sometimes		Often		Very often	
		f	%	f	%	f	%	f	%	f	%
1.	Did you have restlessness of legs or arms at nights causing disruption of sleep?	12	10.9	9	8.2	24	21.8	27	24.5	38	34.5
2.	Was your sleep disturbed due to an urge to move your legs or arms?	12	10.9	9	8.2	25	22.7	27	24.5	37	33.6
3.	Did you suffer from distressing dreams at night?	1	0.9	0	0	9	8.2	28	25.5	72	65.5
4.	Did you wake up early in the morning with painful posturing of arms and legs?	0	0	2	1.8	5	4.5	13	11.8	90	81.8
5.	On waking up, did you experience tremor?	2	1.8	2	1.8	8	7.3	16	14.5	82	74.5
6.	Did you suffer from distressing hallucinations at night?	14	12.7	18	16.4	35	31.8	31	28.2	12	10.9
7.	Did you feel uncomfortable at night because you were unable to turn around in bed or move due to immobility?	2	1.8	5	4.5	7	6.4	16	14.5	80	72.7
8.	Did you feel pain in your arms or legs which woke you up whilst sleeping at night?	0	0	3	2.7	5	4.5	7	6.4	95	86.4
9.	Did you have muscle cramps in your arms or legs which woke you up whilst sleeping at night?	2	1.8	0	0	3	2.7	11	10.0	94	85.5
10.	Did you wake up at night due to snoring or difficulties with breathing?	24	21.8	18	16.4	10	9.1	16	14.5	42	38.2
11.	Overall did you sleep well during the last week?	0	0	2	1.8	8	7.3	18	16.4	82	74.5
12.	Did you have difficulty of falling asleep each night?	0	0	1	0.9	5	4.5	8	7.3	96	87.3
13.	Did you have difficulty of staying asleep?	0	0	2	1.8	4	3.6	8	7.3	96	87.3
14.	Did you get up at night to pass urine?	0	0	1	0.9	20	18.2	50	45.5	39	35.5
15.	Did you feel tired and sleepy after waking up in the morning?	2	1.8	0	0	4	3.6	11	10.0	93	84.5

Table-5: Frequency and percentage distribution of association between selected demographic variables with quality of sleep among Parkinson's disease patients.

(n=110)

SL.NO	Demographic variables	Mild		Moderate		Severe		Chi-square (χ^2)	'P' value
		f	%	f	%	f	%		
1	**Age in years**								
	26-39	1	0.9	2	1.8	2	1.8	19.081	0.004**
	40-53	1	0.9	2	1.8	24	21.8		
	54-67	0	0	4	3.6	61	55.4		
	68-80	0	0	1	0.9	12	10.9		
2	**Sex**								0.596
	Male	2	1.8	6	5.4	65	59.0	1.036	NS
	Female	0	0	3	2.7	34	30.9		
3	**Religion**								
	Hindu	2	1.8	8	7.2	94	85.4		0.703
	Muslim	0	0	1	0.9	5	4.5	0.705	NS
	Christian	0	0	0	0	0	0		
4	**Place of residence**								0.735
	Rural	1	0.9	4	3.6	41	37.2		NS
	Semi urban	0	0	0	0	15	13.6	2.003	
	Urban	1	0.9	5	4.5	43	39.0		
5	**Marital status**								
	Married	2	1.8	8	7.2	76	69.0		
	Unmarried	0	0	1	0.9	0	0	14.057	0.007**
	Widow/widower	0	0	0	0	23	20.9		
	Divorced	0	0	0	0	0	0		
	Separated	0	0	0	0	0	0		
6	**Type of family**								
	Nuclear	2	1.8	9	8.1	86	78.1	1.638	0.802
	Joint	0	0	0	0	12	10.9		NS
	Extended	0	0	0	0	1	0.9		
7	**Family history of Parkinson's disease**								
	Yes	1	0.9	1	0.9	15	13.6	1.964	0.375

	No	1	0.9	8	7.2	84	76.3		NS
8	**Educational status**								
	Illiterate	0	0	2	1.8	60	54.5		
	Primary education	0	0	3	2.7	20	18.1		
	Secondary education	1	0.9	1	0.9	16	14.5	38.837	0.000**
	Intermediate	0	0	2	1.8	0	0		
	Graduate	1	0.9	1	0.9	3	2.7		
	Post graduate	0	0	0	0	0	0		
9	**Occupation**								
	Unemployed	0	0	1	0.9	22	20		
	Daily wage earner	1	0.9	0	0	2	1.8		
	Farmer	0	0	3	2.7	44	40	24.587	0.006**
	Business	0	0	2	1.8	15	13.6		
	Private job	0	0	1	0.9	8	7.2		
	Government job	1	0.9	2	1.8	8	7.2		
10	**Annual income in rupees**								
	1000-5,000/-	0	0	5	4.5	45	40.9		
	5,0001-10,000/-	1	0.9	3	2.7	34	30.9	5.977	0.426
	10,001-15,000/-	0	0	1	0.9	11	10		NS
	15,001-20,000/-	1	0.9	0	0	9	8.1		
11	**Habit of sleeping daytime**								
	Yes	1	0.9	7	6.3	95	86.3	11.086	0.004**
	No	1	0.9	2	1.8	4	3.6		

NOTE: $^{**}P<0.01$, $^{*}P<0.05$, NS-Not significant

Table-6: Distribution of mean variance for demographic variables on domains of quality of sleep among Parkinson's disease patients.

(n=110)

| S.N0	Demographic variables	F value	P value
1.	Age in years	4.938	0.000**
2.	Sex	0.509	0.603
3.	Religion	0.345	0.709
4.	Place of residence	0.039	0.961
5.	Marital status	1.050	0.354
6.	Type of family	0.755	0.472
7.	Family history of Parkinson's disease	0.972	0.381
8.	If yes, relationship with patient	0.893	0.413
9.	Educational status	9.206	0.000**
10.	Occupation	1.500	0.228
11	Monthly income in rupees	1.912	0.153
12	Habit of sleeping daytime	5.996	0.003*
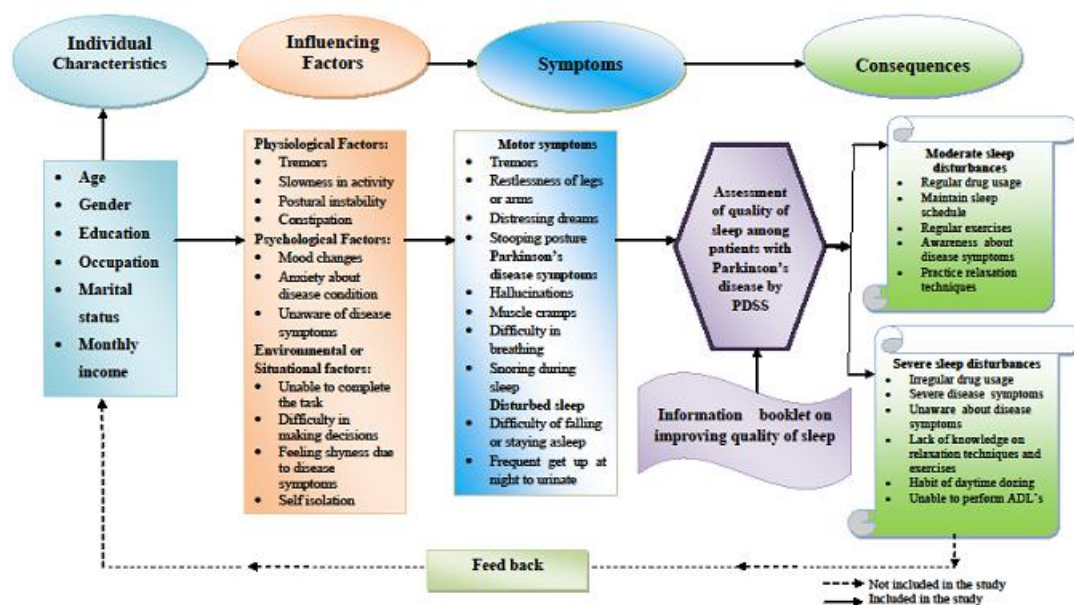
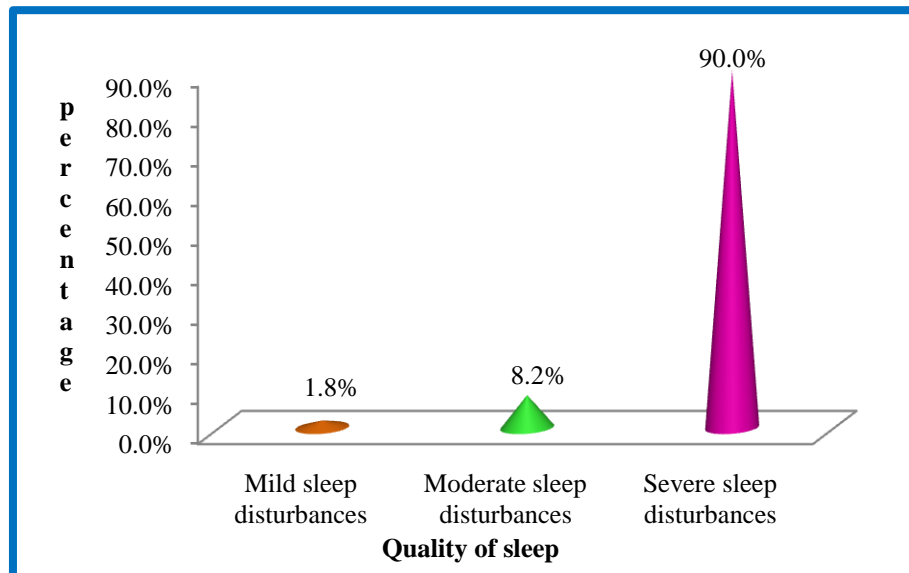Fig no: 1 Modified conceptual framework based on Elizabeth Lenz theory of unpleasant symptoms (2015)

Fig: 2 Percentage distribution of quality of sleep among patients with Parkinson's disease

References

[1]. Mohammad Reza Najafi ,Ahmad Chitsaz and Mohammad Amin Najafi,Quality of Sleep in Patients with Parkinson's disease,International Journal of Preventive Medicine Medknow Publications, 2013,4 (2)
[2]. Keisuke Suzuki et al,Nocturnal Disturbances in Patients with Parkinson's disease, Japan, 2011, 50-61
[3]. Aleksandarvidenovic,Sleep and Parkinson's disease, National Parkinson foundation. 2011,22(2)
[4]. Johan Marinus et al,Sleep in neurologic disease,Assessment of sleep and sleepiness in Parkinson Disease, 2003,26(8), 1049-54
[5]. Elisabeth Svensson et al,Sleep problems in Parkinson's disease a community-based study in Norway, BMC Neurology, 2012,12(71)
[6]. http://www.nhs.uk/conditions/Parkinsons-disease
[7]. Joanne V Hickey,Neurological and Neurosurgical Nursing(6th edition Philadelphia: Lippincott publications; 2009. 691-96)
[8]. Ann Indian AcadNeurol,Sleep disorders in Parkinson's disease Diagnosis and management, 2011Jul, Vol.14(l1): PMCID: PMC3152169
[9]. Sandra J.peterson, Timohy S. Bredow, middle range theories: Application to nursing research. 3rd edition. (China: Lippincott williams and Wilkins) 2013. 68-76
[10]. Marcelo Ataide, Clelia Maria Ribeiro Franco and Otavio Gomes Lins,Daytime Sleepiness and Parkinsons Disease, The Contribution of the Multiple Sleep Latency Test, Hindawai Sleep Disorders, 2014
[11]. Daniel Martinez Ramirez, Sol De Jesus, Roger Walz, et al. A Polysomnographic study of Parkinsons disease sleep architecture,HindwaiParkinsons disease, USA, 2015