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Research Article

### ASSOCIATION BETWEEN PHYSICAL ACTIVITY AND SLEEP IN GERIATRIC WITH CHRONIC PAIN

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**Abstract:**

**Background:** Physical laziness was known as a global prevalent with around 30% of older adults around the world reporting an outline of physical activity that falls short of the World Health Organization recommendations. Quality of Life decrease with age. Exercise has been shown to be actual in educating some psychosocial structures related to quality of life. We carried out a randomized measured trial to confirm the long-term efficiency of severe fitness program against lighter program on the quality of life senior people, compared to quality of life a large normal people

**Objective:** The major objective of this study was to determine the association between physical activity and sleep in geriatrics with chronic pain.

**Method:** This was an analytical associational study and Data was collected from Old age happy homes, Darul Kafala and AAFFIAT. In this study on variance sampling method was used and a sample of 138 patients were taken from a population of 20000 patients from old homes. Study was conducted after approval from institute review of board of respective institute data was taken from subject after informed consent. 138 older people as sample was collected by using convenient sampling technique. The physical activity was measured by using rapid assessment physical activity (RAPA) questionnaire among older adults. The PSQI (Pittsburgh Quality of Sleep Index) was used to measure the quality and pattern of sleep in older adults.

**Results:** Chi square test of independence showed that there was a significant difference among male and female patients. Most of the study participants were with the minimum age group present in the data was 48-year-old person and maximum age group person was of 70 so the average or mean ages of the persons involved in this study were 59 year of age. Most of the females are involved in this study which is 72 in numbers (52.2%) out of 138 and male 66 out of 138 (47.8%) respectively and mostly the old peoples have 5 hours of actual sleep which is 54 in number (39.1%) and after peoples having 7 hours of actual sleep are in number (n=29) 21.0% and after that 4 hours of actual sleep persons which are in numbers 25 out of 138. The old age peoples stay 6 to 7 hours at bed and their numbers are 38(27.5%) and 56 (40.6%) respectively out of total 138 and other than this remaining all are also spend their most of the time in bed more or less although their sleeping hours are very less.

**Conclusion:** PSQI is very helpful to assess quality and pattern of sleep in adults. Sleep duration and sleep disturbance can be measured using this scale. It consists of 9 items and Rapid assessment of physical activities questionnaire (RAPA) is very helpful and it is used for evaluation of physical activity and the reliability of this questionnaire is (0.67). This study concluded that almost a huge number of results shown a significant difference between a sleep and old age peoples regarding the different activities in our daily life comparing with the sleep as well as health of the patient is also compared in this study with the sleep. And almost all the results shown that there is a direct effect of activities with the sleep but a huge number of old peoples admitted that they have a good sleep of 0 to 4 hours even they do some activities done on daily or weekly bases and most of the old age peoples disturbed with some kind of pain at night or a wake for the purpose of washroom but still most of them don't have a complain of early hour sleep but most of them have a complain of 5 or more hours of sleep. so we can finally conclude it that there are very less peoples who have a complain of early hours of sleeps and very high numbers of old peoples have complain of late hour of sleep.

**Key words:** Sleep, old age peoples, male and female, activities, activity, complain.

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**INTRODUCTION:**

Poor sleep in the mutual people had been shown to have an appropriate effects on day-to-day function, for example cognitive dysfunction, decreased capability to complete daily responsibilities, decreased sense of accomplishment and achievement, depressed temperament, and reduced fun of personal relation .[1]. Physical laziness was known as a global prevalent with around 30% of older adults around the world reporting an outline of physical activity that falls short of the World Health Organization recommendations.[2]. It was generally believed that exercise good effects on the value of sleep. However, most studies about exercise and sleep have been connected with the conclusion of exercise on sleep structure and quality, and not on its belongings in the anticipation and dealing of sleep disorders.[3]. The occurrence of sleeplessness in adults range from 11% to 42% in Western States. Epidemiological study had decided the manifestation of sleeplessness, which was categorized by persistent inability to keep sleep, increases with age. Sleep problems had a significant harmful impact on mental and physical health damage superiority of life. Lack of sleep can lead to increased tiredness and extreme daytime tiredness. It can also damage the metabolic, endocrine, and immune systems, between other harmful effect.[4]

There was two-way association between physical movement and sleep superiority whether it would be improved with physical activity or not.[5]. Quality of Life decrease with age. Exercise has been shown to be actual in educating some psychosocial structures related to quality of life. We carried out a randomized measured trial to confirm the long-term efficiency of severe fitness program against lighter program on the quality of life senior people, compared to quality of life a large normal people.[6]. Exercise and sleep are both key health symbols that were reduced with age and stay variable well into advanced life. The present study observed both the chronic and acute relations between exercise and self-reported sleep in command adults done an irrelevant analysis of a clinical test of

an existence contribution. 79 community-dwelling primarily sedentary, older adults (Average Age 63.58 Years) accomplished daily home-based calculations of exercise and sleep consuming daily practice. [7]

**Objective:**

To determine the association between physical activity and sleep in geriatrics with chronic pain.

**Rationale:**

Drive of this study was to measure all the determinants and reasons influencing sleep disturbance and physical activity among geriatrics population.

Geriatrics population can develop different coping strategies against physical activity and quality of life can be improved.

**LITERATURE REVIEW:**

Andrews,et al.(2014) studied the organization between objective daytime physical activity and subsequent objective sleep for folks with chronic pain while scheming. An observational imminent within-person study strategy was used for agony and psychosocial variable. Fifty adults with chronic pain were enlisted. This study found that high-intensity activity and high variations in activity are associated with inferior sleep at night; hence, activity variation may be a key treatment approach to address sleep complaints in persons with chronic pain.[1]

Nicole K., et al. (2014) studied that in patient with chronic pain, the improved quality of sleep will enhance functional capacity. They conducted actigraphy on 119 patients. They concluded that improved sleeps will enhance the physical performances in such patients. [2]

Duane L, et al.(1998) conducted a study on sleep disturbances and its association with physical performance. They collected data from 319 men and 403 women through questionnaires. They found that engaging it a exercise on daily basis will result in improved quality of sleep [3]

Pei-Yu Yang<sup>1</sup>, et al. (2012) analyzed that sleep disturbances can be improved by indulging into some exercise program. They did randomized trial in 305 patients and they came up with the results that exercise had a good impact on sleep quality in elder and young adults. (Yang, 2012 #33)

Brett Holfeld, et al (2014) conducted study among sleep and physical performances. They did it on 426 older patients and they found that they both are associated with each other. Improved quality of sleep will result in better performances. [5]

Gioia Mura<sup>1</sup>, et al.(2014) analyzed long-term relationship of exercises with improved life style and quality. They did randomized control trials and collected data from average >65 years old people. They found that in both depressed and postural gymnastic group, there is improved life quality with exercise program. [6]

Joseph M., et al.(2014) conducted study on exercise and sleep quality in older patients. They did randomized trial with 79 older adults. They concluded that exercise had immediate effect on patient with poor sleep quality and their sleep and awakening time improves with it.[7]

Lambiase, et al. (2013) analyzed relationship among sleep quality and physical activity in aged women. They collected data from 143 women and examined them. They concluded that improved sleep was linked with improved physical performances. (Lambiase, 2013 #34)

### Hypothesis:

#### Alternate hypothesis: -

There is relationship between physical activity and sleep in geriatrics with chronic pain.

#### Null hypothesis: -

There is no relationship between physical activity and sleep in geriatrics with chronic pain.

## MATERIALS AND METHODS:

**Study design:** It was an analytical associational study.

**Setting:** Data was collected from Old age happy homes, Darul Kafala and AAFFIAT.

#### Sampling technique:

Convenience sampling method was used

**Sample size:** A sample of 138 patients were taken from a population of 20000 patients from old homes. Sample size calculated by 'Raosoft' in which the margin of error was 5 %. Confidence level is 90 % response rate 80 % Sample size formula by which Raosoft's calculations are as follows:

$$x = Z(c/100)^2 r(100-r)$$

$$n = N x / ((N-1)E^2 + x)$$

$$E = \text{Sqrt}[(N \cdot n)^x / n(N-1)]$$

In this formula:

sample size = n

Margin of error = E

Population size = N

fraction of responses = r

critical value for the confidence level c = Z(c/100)

#### Sample selection criteria: -

##### Inclusive criteria: -

Data collected from all Zeenat old home, Happy old home in Lahore

Different GOVT Hospitals in Lahore

Geriatrics population 40 to 60 age

##### Exclusive criteria: -

Geriatrics population who were using any sedative drugs.

Geriatrics who were facing any family stress.

Geriatrics population who were suffering from any chronic illness and due to pain and other related factors and physical activity their sleep is disturb.

Geriatrics population suffering from any physical and mental disorder due to which their sleep was disturb

#### Data collection procedure:

Study was conducted after approval from institute review of board of respective institute. The data was taken from subject after informed consent. 138 older people as sample was collected by using convenient sampling technique. The physical activity was measured by using rapid assessment physical activity (RAPA) questionnaire among older adults. The PSQI (Pittsburgh Quality of Sleep Index) was used to measure the quality and pattern of sleep in older adults.

#### Statistical Procedure:

All collected data was entered in computer program SPSS version 20 and analyzed through this software. The Categorical variable was used for frequency and percentage. And for quantitative variables mean and standard deviation used P.value 0.05 was considered significantly. The chi-square test was used to find out the association of physical activity (PA) and for the

quality and pattern of sleep PSQI (Pittsburgh Quality of Sleep Index) was used among elderly population.

With the respect of respondent and the confidential information of subjects I was consider all value of participants of ethics and was never use for any other purpose it was be only used for research.

#### Ethical consideration:

### RESULTS:

#### 4.1

	N	Minimum	maximum	Mean	Standard deviation
Age Valid n(list wise)	138 138	48.00	70.00	59.9058	6.26529

Concluded the above table that out of 138 peoples (sample size) ,the minimum age group present in the data is 48 year old person and maximum age group person is of 70 so the average or mean ages of the persons involved in this study are 59 year of age.

#### 4.2

	Frequency	Valid Percent
Male	66	47.8
Female	72	52.2
Total	138	100.0

Most of the females are involved in this study which is 72 in numbers (52.2%) out of 138 and male 66 out of 138 (47.8%) respectively.

#### 4.3

	Frequency	Valid Percent
3	1	.7
4	25	18.1
5	54	39.1
6	23	16.7
7	29	21.0
8	6	4.3
Total	138	100.0

Most of the old peoples have 5 hours of actual sleep which is 54 in number (39.1%) and after peoples having 7 hours of actual sleep Are in number (n=29) 21.0% and after that 4 hours of actual sleep persons which are in numbers 25 out of 138.

#### 4.4

	Frequency	Valid Percent
5	8	5.8
6	38	27.5
7	56	40.6
8	33	23.9
9	1	.7
10	2	1.4
Total	138	100.0

Most of the old age peoples stay 6 to 7 hours at bed and their numbers are 38(27.5%) and 56 (40.6%) respectively out of total 138 and other than this remaining all are also spend their most of the time in bed more or less although their sleeping hours are very less

#### 4.5

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Physicalactivity	Underactive	1	0	1
	Underactivelight	12	4	16
	Underactiveregular	13	42	55
	Active	11	55	66
Total		37	101	138

Out of 138 only 37 old peoples who have a good sleep of 0 to 4 hours and other 101 having complain of poor sleep after 5 hours. Most of the old peoples which are physically under active regularly in our routine life they have a good sleep of 4 to 5 hours and that are only 13 in number out of 55 and 42 complains that after doing under activity light they have a poor sleep of more than 5 hour. Those who are active are 11 in number having no complain of 0 to 4

hours of sleep and out of 66 and 55 complains of poor sleep out of 66 and finally if we talk about under active light that are 12 in numbers who have a comfort of sleep from 0 to 4 hours out of 16 and only 4 having a complain of poor sleep and if we talk about under activity only 1 person feel good sleep and no one have a sleep of more than 5 hours.

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Ratesleepquality	very good	23	20	43
	fairly good	11	40	51
	fairly bad	0	33	33
	very bad	3	8	11
Total		37	101	138

6

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Problemtoget thingsdone	Not	31	15	46
	less than a week	0	29	29
	twice a week	6	52	58
	three or more times a week	0	5	5
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Stayawakewhileactivity	Not	24	12	36
	less than a week	9	35	44
	twice a week	4	42	46
	three or more times a week	0	12	12
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Takemedicinetosleep	Not	27	49	76
	less than a week	3	21	24
	twice a week	4	27	31
	three or more times a week	3	4	7
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Howoftentroublesleeping	Not	23	15	38
	less than a week	14	21	35
	twice a week	0	37	37
	three or more times a week	0	28	28
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Havepain	Not	21	9	30
	less than a week	6	20	26
	twice a week	3	45	48
	three or more times a week	7	27	34
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Baddreams	Not	18	6	24
	less than a week	15	19	34
	twice a week	4	38	42
	three or more times a week	0	38	38
Total		37	101	138

		Sleepquality		Total
		0-4 good sleep	5 or more poor sleep	
Feeltoohot	Not	31	43	74
	less than a week	0	21	21
	twice a week	3	14	17
	three or more times a week	3	23	26
Total		37	101	138

### CONCLUSION:

PSQI is very helpful to assess quality and pattern of sleep in adults. Sleep duration and sleep disturbance can be measured using this scale. It consists of 9 items and Rapid assessment of physical activities questionnaire (RAPA) is very helpful and it is used for evaluation of physical activity and the reliability of this questionnaire is (0.67). This study concluded that almost a huge number of results shown a significant difference between a sleep and old age peoples regarding the different activities in our daily life comparing with the sleep as well as health of the patient is also compared in this study with the sleep. And almost all the results shown that there is a direct effect of activities with the sleep but a huge number of old peoples admitted that they have a good sleep of 0 to 4 hours even they do some activities done on

daily or weekly bases and most of the old age peoples disturbed with some kind of pain at night or a wake for the purpose of washroom but still most of them don't have a complain of early hour sleep but most of them have a complain of 5 or more hours of sleep.so we can finally conclude it that there are very less peoples who have a complain of early hours of sleeps and very high numbers of old peoples have complain of late hour of sleep.

### DISCUSSION:

Lambiase, et al. (2013) analyzed relationship among sleep quality and physical activity in aged women. They collected data from 143 women and examined them. They concluded that improved sleep is linked with improved physical performances. )Lambiase, 2013 #34). Andrews,et al.(2014) studied the



organization between objective daytime physical activity and subsequent objective sleep for folks with chronic pain while scheming. An observational imminent within-person study strategy was used for agony and psychosocial variable. Fifty adults with chronic pain were enlisted. This study found that high-intensity activity and high variations in activity are associated with inferior sleep at night; hence, activity variation may be a key treatment approach to address sleep complaints in persons with chronic pain.[1]

Nicole K., et al. (2014) studied that in patient with chronic pain, the improved quality of sleep will enhance functional capacity. They conducted actigraphy on 119 patients. They concluded that improved sleeps will enhance the physical performances in such patients. [2]

This study is based on Association between Physical Activity and Sleep in Geriatric with Chronic pain. the finding of this study shows the quality sleep of the old age peoples with different activities also focused the early and late hours ( 5 or more than 5) of sleep. As there were 138 individuals join up in this study. The old age individuals were selected according to the set criteria mentioned in the inclusion criteria. The analysis was done on various grounds i.e. Have pain in sleep, awaking at night for washroom etc. Demographic information was analyzed along with the other parametric statistical tools. Out of 138 patients they are equally divided into male and female and most of them were not satisfied with a their late hours of sleep but almost all the old individual agree with that they have a good sleep of 0 to 4 hours.

Duane L, et al.(1998) conducted a study on sleep disturbances and its association with physical performance. They collected data from 319 men and 403 women through questionnaires. They found that engaging its a exercise on daily basis will result in improved quality of sleep [3]. Brett Holfeld,et al (2014) conducted study among sleep and physical performances. They did it on 426 older patients and they found that they both are associated with each other. Improved quality of sleep will result in better performances. [5]. Gioia Mural, et al.(2014) analyzed long-term relationship of exercises with improved life style and quality. They did randomized control trials and collected data from average >65 years old people. They found that in both depressed and postural gymnastic group, there is improved life quality with exercise program. [6].

#### LIMITATIONS/ RECOMMENDATIONS:

As the conduction time for this particular study is limited that's why data is collected from limited number of individuals of old age. Other limitations include communication barrier, & education regarding the study. To subside above mentioned constrains awareness programs are conducted for individuals. Communication barrier can also be minimized by translating questionnaire in particular language of residents.

#### APPENDICES:

##### Appendix A: CONSENT FORM

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Gender:

Male

Female

The study you are about to participate is **“Association between physical activity and sleep in geriatric with chronic pain”**

The study has no potential harm to participants. All data collected from you will be coded in order to protect your identity, and should not be disclosed to anyone. Following the study there will be no way to connect your name with your data. Your answers to the questions will not affect the quality of treatment given to you. Any additional information about the study results will be provided to you at its conclusion, upon your request.

You are free to withdraw from the study at any time. You agree to participate, indicating that you have read and understood the nature of the study, and that all your inquiries concerning the activities have been answered to your satisfaction.

Signature:

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### Appendix B:

#### Sleep Quality Assessment (PSQI)

**INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.**

During the past month,

1. When have you usually gone to bed? \_\_\_\_\_
2. How long (in minutes) has it taken you to fall asleep each night? \_\_\_\_\_
3. What time have you usually gotten up in the morning? \_\_\_\_\_
4. A. How many hours of actual sleep did you get at night? \_\_\_\_\_
- B. How many hours were you in bed? \_\_\_\_\_

5. During the past month, how often have you had trouble sleeping because you

Cannot get to sleep within 30 minutes

Wake up in the middle of the night or early morning

Have to get up to use the bathroom

Cannot breathe comfortably

Cough or snore loudly

Feel too cold

Feel too hot

Have bad dreams

Have pain

Other reason (s), please describe, including how often you have had trouble sleeping because of this reason (s)

6. During the past month, how often have you taken medicine (prescribed or “over the counter”) to help you sleep?

7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

9. During the past month, how would you rate your sleep quality overall?