

Nursing Intervention Strategies and Their Effectiveness on Restless Leg Syndrome and Psycho-Social Problems in Chronic Kidney Disease Patients

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Abstract

Background: Chronic kidney disease is a global health problem affecting 843.6 million people with 1 million deaths and the 12th leading non-communicable cause of death worldwide. Insomnia is a disturbing problem found in chronic kidney disease patients, leading to physiological problems like fatigue, edema, and restless leg syndrome most of the time. The objective of this study was to assess the effectiveness of nursing intervention strategies on physiological and psycho-social problems. **Materials and Methods:** A quantitative research approach with quasi-experimental pre-test and post-test design was used to assess the effectiveness of nursing intervention strategies on physiological and psycho-social problems among 30 chronic kidney disease patients, 15 in control and experimental each, admitted in a selected hospital of Punjab. Convenience sampling was used to assign the samples, and data were collected through an interview schedule by using standardized scales. IEC number: 2017/08/5051. **Results:** The result of the study showed that the baseline restless leg syndrome mean score was 9.67, whereas the psycho-social problem baseline mean score was 79.80, and after post-test, the mean score was reduced to 7.67 in physiological and 66.87 in psycho-social problems in the experimental group. Intervention was found to be effective in reduction of physiological and psycho-social symptoms of chronic kidney disease patients significantly ($P \leq 0.05$). **Conclusions:** The study showed that nursing intervention strategies were effective in reduction of physiological and psycho-social symptoms.

Keywords: Nursing intervention strategies, physiological problems, psycho-social problems

INTRODUCTION

Chronic kidney disease is a worldwide problem with a major cause to the health system.^[1] An increase in the hypertension, obesity, and primary renal problems are the major reasons for chronic kidney disease disorders.^[2] It is now recognized as a major health problem.^[3] With an increase in life expectancy and prevalence of life style diseases, chronic kidney disease has increased by 30% in USA.^[4] In western countries, about two-third of the cases of chronic kidney disease account for diabetes and hypertension patients.^[5] Diabetes and hypertension are of major concern in India today, which account for 40–60% cases of chronic kidney disease.^[6]

Chronic kidney disease is a progressive, irreversible deterioration in renal function in which the body's ability to maintain metabolic, fluid, and electrolyte balance fails,

resulting in uremia or azotemia, which disturbs the homeostasis of all systems of the body. It can progress to end-stage renal disease (Stage 5 CDK), in which the glomerular filtration rate (GFR) falls to 15 ml/minute/1.73 m² (normal GFR = 125 ml/minute/1.73 m²).^[7]

Chronic kidney disease patients are not diagnosed timely because people lack knowledge about hypertension and diabetes, which can also lead to chronic kidney disease, and

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screening is not done timely. Chronic kidney disease is not being detected early enough to initiate treatment regimens and reduces death and disability. Interventions are being delivered too late to improve population-based outcomes. Measures should be made to teach the early screening and risk factors to chronic kidney disease patients.^[8]

Fatigue has been demonstrated as a highly prevalent symptom in people with advanced chronic kidney disease; they commonly experience fatigue and reduced levels of fitness, affecting routine activities of daily life.^[9]

Restless leg syndrome (RLS) is commonly found in people with advanced kidney disease who wake up in the middle of the night because of the uncomfortable sensation in their legs. The diagnosis of RLS is based on clinical signs and symptoms. Essential criteria for the diagnosis of RLS, according to the International Restless Legs Study Group (IRLSSG) as reported by Allen RP, show the need to move the legs uncomfortably appearing within 15 to 30 minutes of going to bed.^[10]

Trace of prevention is important than cure. More epidemiological studies should be conducted to find etiologies like diabetes, hypertension, cardiovascular disease, and obesity. Better screening is a financial issue, which will be taken care of slowly.^[11]

Physiological problems like insomnia, fatigue, and RLS are the major issues for which we have strategies available. Proper medical care requires not only biomedical outcome but also careful attention to psychological outcomes.^[12] Early identification of psycho-social problems can prevent depression in chronic kidney disease patients. The only thing is to take initiative for implementation by health care workers and motivation of the chronic kidney disease patients as well. Without these components, good long-term outcomes are not possible. With these measures, patients can live long, enjoy a high quality of life, and live independently and productively—if they are first able to function, both physically and mentally.^[13] Various studies have reported that by learning about the disease process and following strategies, fewer symptoms are reported. It helped them to regain their self-confidence and improvement in their symptoms. Further, patients who are motivated to learn about their treatment have better outcomes and improved quality of life.^[14]

OBJECTIVES OF THE STUDY

The objective of the study was to assess the effectiveness of nursing intervention strategies on physiological and psycho-social problems in patients with chronic kidney disease and to determine the effectiveness of nursing intervention strategies on physiological and psycho-social problems among patients with chronic kidney disease and to find out the association of nursing intervention strategies on physiological and psycho-social problems.

METHODS

Subjects

The population comprised 30 chronic kidney disease patients who were admitted in a selected hospital of Punjab. Data collection of the pilot study was done from July 8, 2022 to August 14, 2022 among 30 chronic kidney disease patients (15 in the experimental group and 15 in the control group) to check the feasibility of the study and reliability of the tool. The subjects were selected by using the convenience sampling technique and the pre-determined criteria. The inclusion criteria in the study were chronic kidney disease patients admitted in the nephrology ward of the selected hospital between age 18 and 72 years and who were conscious and co-operative. The exclusion criteria were chronic kidney disease patients who were mentally unstable, non-co-operative, and not willing to be the part of study.

Study designed

Quasi-experimental research design and convenient sampling methods were considered to enroll for the subjects. All participants were divided into two groups. First, the data were collected from the experimental group, pre-test was done on day 1, and the first post-test was done on the sixth day (before discharge) after receiving interventions on days 2, 3, 4, and 5. The second post-test was conducted after 7–10 days on their first follow-up visit. The same procedure was implemented for the control group except giving interventions (routine care was given). All the participants were tested three times, that is, day 1 (pre), day 6 (post-test 1), and day 15 (post-test 2). Participants were free to withdraw from implementations of nursing intervention strategies or assessment at any point of time during study. The final number of each group who completed the study is shown in the flow diagram of quasi-experimental trials [Figure 1].

Assessment

The study tools used for data collection included a questionnaire which consisted of two sections containing demographic variables and clinical variables of the chronic kidney disease patients such as age, gender, family structure, educational status, occupation, monthly family income, co-morbidity duration under treatment, stages of chronic kidney disease, and frequency of dialysis. The interview schedule for assessing physiological problem standardized scales was used for assessing restless leg syndrome (international leg syndrome scale consisting of five items). Psycho-social problems were assessed by using a psycho-social assessment tool which consists of a total number of items of 30. The tool was converted into the local language of study subjects. Ethical committee permission and administrative permission were taken from the concerning authority. Informed consent was obtained from the study participants before commencement of the study. Reliability of the tool was done by test–re-test method.

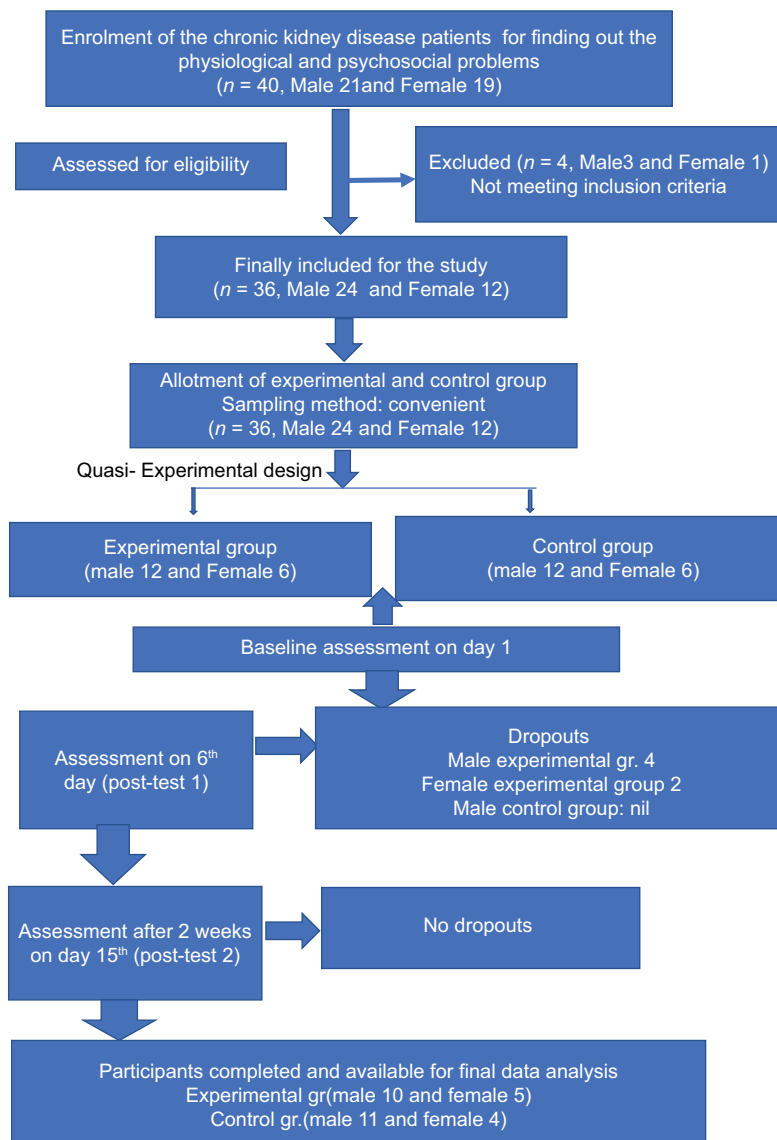


Figure 1: Consort diagram showing chronic kidney disease patients in experimental and control group

Interventions

Experimental group

To the experimental group, nursing intervention strategies such as leg massaging, leg elevation therapy for 30 minutes, and deep breathing exercises and progressive muscle relaxation techniques were provided for a period of 2 weeks. The total practice time was 90 min. Furthermore, a general record was maintained of the subjects' activities, diet, and lifestyle during the study period [Figure 2].

Control group

The subjects in the control group were only provided with routine care. Researchers kept a record of physiological and psycho-social problems among chronic kidney disease patients during the study period [Figure 2].

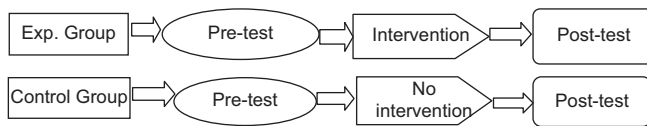
Statistical analysis

Data obtained through different tests and measurements were

processed for data analysis. Along with descriptive frequencies, Chi-square statistics and *t*-test were employed for nominal and interval-level variables, respectively. The mean and standard deviation as descriptive statistics and repeated measures analysis of variance (RM ANOVA) as inferential statistics were used for the data analysis. The significant level was set at 0.05 levels ($P < 0.05$).

RESULTS

Table 1 depicts that in the experimental group, the majority (55.8%) of the study participants were in the age group of 55–72 years, Half (66.7%) were males, and approximately two-third (66.7%) belong to a nuclear family. Almost half (46.7%) of them had 10th grade education, almost half (53.3%) of the study participants were non-working, and 53.3% of study participants were from lower-income groups. Every second (53.3%) study participant had a duration



O₁ = 1st observation done on 1st day of admission.
 X = Implementation of "Nursing Intervention Strategies" to experimental group on 2nd, 3rd, 4th and 5th day during hospitalization.
 RC = Implementation of routine care to control group during hospitalization.
 O₂ = 2nd observation done on 6th day at the time of discharge.
 O₃ = 3rd observation done on 15th day in OPD during first follow up visit

Day wise activity	Experimental Group	Control Group
Day-1 (On admission)	Pre-test (1 st observation): Tools for data collection: - • Personal and clinical profile of Chronic kidney disease patients. • International restless leg syndrome scale.	Pre-test (1 st observation): Tools for data collection: - • Personal and clinical profile of Chronic kidney disease patients. • International restless leg syndrome scale.
Day-2, 3, 4 and 5 (During hospitalization)	Intervention: - 1. Implementation of Nursing Strategies. • Leg elevation therapy • Progressive muscle relaxation therapy • Leg massaging • Deep breathing exercises • Talk therapy • Cultivating support group 2. Routine care 3. Methods used for providing nursing intervention strategies were PPT slides, demonstration and booklet	No intervention • General education • Routine care.
Day-6 (On discharge)	Post-test 1 i) 2 nd observation ii) Demonstration on Nursing Intervention Strategies.	Post-test 1 i) 2 nd observation ii) Routine discharge advice
Day-15 (During first follow up visit)	Post-test 2 3 rd observation	Post-test 2 3 rd observation

Figure 2: Research Design

under treatment of more than 36 months in the experimental group. The majority (53.3%) of the study participants were in stage III of chronic kidney disease. All the patients with chronic kidney disease (100%) were on hemodialysis, and no one fell under the category of peritoneal dialysis. In the control group, two-third (53.3%) were aged between 37 and 54 years and no one was aged above 72 years. Two-third (73.3%) of the study participants were male. Every second (53.3%) belonged to a joint family. More than half (53.4%) of the study participants had 10th education. 66.7% were from an upper class. Most (60%) of the study participants were non-working. Two-thirds (86.7%) of the

Table 1: Frequency, percentage distribution, and homogeneity of experimental and control groups of chronic kidney disease patients n=30

Variables	Experimental Group	Control group	χ ² (p-value)
Age (in years)			
18-36	2	3	1.304 ^{NS}
37-54	6	8	(0.52)
55-72	7	4	
>72	-	-	
Gender			
Male	10	11	0.159 ^{NS}
Female	5	4	(0.69)
Family structure			
Nuclear	5	8	1.222 ^{NS}
Joint	10	7	(0.26)
Educational status			
10 th	7	7	2.667 ^{NS}
Graduate and above	2	2	(0.75)
Occupation			
Non-working	8	9	0.136 ^{NS}
			(0.71)
Socioeconomic Status			
Upper middle class	6	10	2.692 ^{NS}
Lower middle class	8	5	(0.26)
Duration under treatment			
>36 months	8	7	3.723 ^{NS}
			(0.29)
Stages of chronic kidney disease			
Stage iii	8	5	2.692 ^{NS}
Stage iv	6	10	(0.26)
Type of dialysis			
Hemodialysis	15	15	-
Frequency of dialysis			
Twice a week	13	13	1.333 ^{NS}
			(0.21)

NS: Non-significant

study participants had undergone three times of dialysis in a week. Half (66.7%) of the study participants had less than 3 years of hemodialysis. Homogeneity of the study participants was tested between demographic variables of control and experimental groups. Since all data were categorical in nature, Chi square test was performed to find significant association.

Table 2 reveals that the mean restless leg syndrome score was 9.67; after a week of intervention with nursing intervention strategies, the mean score was reduced to 7.93, and after another 1 week of intervention, the mean score was further reduced to 7.67 in the experimental group. However, not much improvement can be seen in patients with the control group from the mean restless leg syndrome score in pre-test from 8.20 to 7.60 in post-test2. It can be interpreted that the nursing intervention strategies have significantly reduced the severity of the restless leg syndrome problems. The difference was found to be statistically significant at $P \leq 0.05$.

Table 3 reveals that the mean psycho-social problem score was 70.33; after a week of intervention with nursing intervention strategies, the mean score was reduced to 53.47, and after another 1 week of intervention, the mean score was further reduced to 50.27 in the experimental group. However, slight improvement can be seen in patients with the control group from the mean psycho-social problem score in pre-test from 60.67 to 58.60 in post-test2. The difference in mean score in the experimental group was found to be statistically highly significant at $P < 0.01$ level of significance.

Table 4 depicts the association of mean restless leg syndrome score with selected variables of chronic kidney disease patients. There was no statistically significant association found between mean restless leg syndrome score and age, gender, family structure, educational status, occupation, socio-economic status, duration under treatment, stages of chronic kidney disease, type of dialysis, and frequency of dialysis of chronic kidney disease patients in both the groups. Table 5 shows the association between mean psycho-social problem score and variables. There was a statistically significant difference found between mean psycho-social problem score and educational status of the chronic kidney disease patients in the experimental group. There was no statistically significant difference found between mean psycho-social problem score and age, family structure, occupation, and socio-economic status of chronic kidney disease patients in duration under treatment, stages of chronic

kidney disease, type of dialysis, and frequency of dialysis in both the groups.

DISCUSSION

The study findings illustrated two-third (60%) of the chronic kidney disease patients reported low restless leg syndrome symptoms, and 6.7% reported no restless leg syndrome symptoms in the control group. However, in the experimental group, 53.3%, 40%, and 6.7% have reported restless leg syndrome symptoms in low, no, and high categories, respectively. The study findings were inconsistent with Sabry AA-201018 in a cohort study to assess sleep disorders among 88 chronic kidney disease patients, which showed the prevalence of insomnia as 65.9%, followed by restless leg syndrome as 42%.^[15,16]

The frequency and percentage distribution of pre-test, post-test 1, and post-test 2 overall restless leg syndrome score was higher in pre-test 7 (46.7%), followed by 1 (6.7%) least in post-test 1 and post-test2. These findings are supported by Charlotte Thomas-Hawkins and Donna Zazworsky-2005, who revealed in the study that experimental group subjects who received nursing intervention strategies have shown a substantial decline in post-test mean and SD scores in five physiological problems (systolic blood pressure, edema of feet, insomnia, fatigue, and restless leg syndrome).^[17]

The comparison between pre-test and post-test mean scores of mean psycho-social problem score was 70.33; after a week

Table 2: Comparison of pre- and post-intervention mean restless leg syndrome scores in chronic kidney disease patients in experimental and control groups n=30

Variable of assessment	Experimental group n=15				Control group n=15			
	Mean±SD	Mean diff	df	t p-value	Mean±SD	Mean diff	df	t p-value
Pre-test	9.67±4.287	1.733	14	3.272	8.20±3.570	0.267	14	0.774
Post-test 1	7.93±2.658			(.006)*	7.93±3.035			(0.45) ^{NS}
Pre-test	9.67±4.287	2.000	14	3.125	8.20±3.570	0.600	14	1.288
Post-test 2	7.67±2.637			(.007)*	7.60±2.414			(0.219) ^{NS}
Post-test 1	7.93±2.658	0.267	14	1.075	7.93±3.035	0.333	14	1.000
Post-test 2	7.67±2.637			(.30) ^{NS}	7.60±2.414			(0.334) ^{NS}

Maximum score=15 * Significant at $p \leq 0.05$ level
Minimum score=5

Table 3: Comparison of pre- and post-intervention mean psycho-social problem scores in chronic kidney disease patients in experimental and control groups n=30

Variable of assessment	Experimental group n=15				Control group n=15			
	Mean±SD	Mean diff	df	t p-value	Mean±SD	Mean diff	df	t p-value
Pre-test	70.33±12.19	16.86	14	3.272	60.67±9.469	0.400	14	1.193
Post-test 1	53.47±3.833			(.000) **	60.27±8.606			(.253) ^{NS}
Pre-test	70.33±12.19	20.06	14	3.125	60.67±9.469	2.067	14	1.073
Post-test 2	50.27±2.235			(.000) **	58.60±6.653			(.301) ^{NS}
Post-test 1	53.47±3.833	3.200	14	1.075	60.27±8.606	1.667	14	1.044
Post-test 2	50.27±2.235			(.099) ^{NS}	58.60±6.653			(.314) ^{NS}

Maximum score=15 * Significant at $p \leq 0.05$ level
Minimum score=5 **Significant at $p < 0.01$ level

Table 4: Association between mean restless leg syndrome score and selected variables of chronic kidney disease patients n=30

s. no	variables	Mean Restless leg syndrome score					
		Experimental group (15)			Control group (15)		
		n	Mean ±SD	F (p-value)	n	Mean ±SD	F (p-value)
1.	Age in years						1.878
	18-36	2	10.00±7.071	0.550 (0.591) ^{NS}	3	10.00±5.000	(0.195) ^{NS}
	37-54	6	11.00±3.742		8	8.88±3.441	
	55-72	7	8.43±4.392		4	5.50±1.000	
>72	-	-	-		-		
2.	Gender						
	Male	10	9.10±4.630	2.064 (0.174) ^{NS}	11	8.00±3.286	1.031 (t)
	Female	5	10.80±3.701		4	8.75±4.787	(0.328) ^{NS}
3.	Family structure						
	Joint	5	10.60±5.128	0.339 (0.571) ^{NS}	8	7.25±3.770	1.234 (t)
	Nuclear	10	9.20±4.022		7	9.29±3.251	(0.287) ^{NS}
	Extended	-	-		-	-	
4.	Educational status						
	Illiterate	1	14	0.579 (0.716) ^{NS}	1	5.00	0.449
	Primary	1	5		1	5.00	(0.771) ^{NS}
	Middle	2	9.50±6.364		4	8.75±4.787	
	10 th	7	9.43±4.541		7	9.00±3.416	
	10+2	2	12.50±3.536		2	7.50±3.536	
	Graduate and	2	8.00±4.243		-	-	
5.	Occupation						
	Non-Working	8	9.38±3.889	1.189 (0.295) ^{NS}	9	6.89±2.205	3.752 (t)
	Working	7	10.00±5.000		6	10.17±4.491	(0.081) ^{NS}
6.	Socio-economic status						
	Upper (I)	1	10.00	0.746 (0.495) ^{NS}	-	-	0.838
	Upper Middle (II)	6	8.00±4.648		10	8.80±3.120	(0.377) ^{NS}
	Lower Middle	8	10.88±4.155		5	7.00±4.472	
	Upper Lower (IV)	-	-		-	-	
Lower (V)	-	-	-		-		

NS=non-significant

of intervention with nursing intervention strategies, the mean score was reduced to 53.47, and after another 1 week of intervention, the mean score was further reduced to 50.27 in the experimental group. However, slight improvement can be seen in patients with the control group from the mean psycho-social problem score in pre-test from 60.67 to 58.60 in post-test 2. The difference in mean score in the experimental group was found to be statistically highly significant at $P < 0.01$ level of significance. The above findings are consistent with the results of the study by Eile an Palani,^[18] who noticed the significant difference in post-test mean score of psycho-social problems in experimental and control groups.

CONCLUSION

The present study concludes that the majority of the subjects from both the groups were suffering from physiological and psycho-social health problems. So, the use of nursing intervention strategies in physiological and psycho-social problems made a significant impact in reducing their problems. Based on the study findings, it can be concluded that nursing

intervention strategies (progressive muscle relaxation therapy, leg massaging) were effective in reducing health problems and minimizing physiological and psycho-social problems. The practice of these strategies does not require machines but only willingness of patients to practice these nursing intervention strategies.

Delimitations: The present study was delimited to patients admitted in a selected hospital and who were willing to participate in the study and are conscious. Since the study was conducted in a clinical setting where there was a possibility of treatment effect coming in between as an extraneous variable, the investigator could not control in shifting of patients toward renal transplantation surgeries.

Recommendations: A similar study can be done on larger samples with multiple nephrology units in the country. A comparative study can be done between government and private hospitals.

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Table 5: Association between mean psychosocial problem score and selected variables of chronic kidney disease patients. n=30

s. no	variables	Psychosocial problem score					
		Experimental group (15)			Control group (15)		
		n	Mean±SD	F (p-value)	n	Mean±SD	F (p-value)
1.	Age						
	18-36	2	67.00±19.79	0.075	3	52.33±7.02	2.379
	37-54	6	70.83±9.10	(0.92) ^{NS}	8	60.75±6.58	(0.13) ^{NS}
	55-72	7	70.86±14.43		4	66.75±12.86	
	>72	-	-		-		
2.	Gender						
	Male	10	75.80±10.009	3.13	11	62.82±9.46	1.527 (t)
	Female	5	59.40±5.099	(.008) ^{NS}	4	54.75±7.50	(0.15) ^{NS}
3.	Family structure						
	Joint	5	67.60±15.72	0.35	8	63.88±12.10	2.126
	Nuclear	10	71.70±10.74	(0.55) ^{NS}	7	57.00±3.00	(0.16) ^{NS}
	Extended	-	-		-		
4.	Educational status						
	Illiterate	1	46.00	4.36	1	62.00	0.943
	Primary	1	53.00	(0.02)*	1	58.00	(0.47) ^{NS}
	Middle	2	63.50±6.36		4	64.00±14.09	
	10 th	7	72.86±9.52		7	62.29±6.87	
	10+2	2	75.00±0.24		2	49.00±5.65	
	Graduate and above	2	84.50±2.12		-	-	
5.	Occupation						
	Non-Working	8	67.38±13.23	-1.004	9	57.22±6.03	-1.87
	Working	7	73.31±10.85	(0.33) ^{NS}	6	65.83±11.80	(0.84) ^{NS}
6.	Socio-economic status						
	Upper (I)	1	59.00	0.615	-	-	3.463
	Upper Middle (II)	6	68.83±14.60	(0.55) ^{NS}	10	57.70±6.05	(0.86) ^{NS}
	Lower Middle	8	72.88±10.84		5	66.70±12.85	
	Upper Lower (IV)	-	-		-		

Significant at 0.05 level

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Conflicts of interest

There are no conflicts of interest.

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