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Warm Massage Therapy: Easing Restless Leg Syndrome In Diabetics

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Abstract

Background of the Study: Restless Legs Syndrome (RLS) is a common neurological disorder characterized by an irresistible urge to move the legs, particularly during rest, leading to sleep disturbances and impaired quality of life. The prevalence of RLS is significantly higher among individuals with Diabetes Mellitus (DM), affecting nearly 20-40% of diabetic patients. Effective management strategies are essential to alleviate symptoms and improve well-being. Warm massage therapy has been proposed as a potential non-pharmacological intervention to reduce RLS severity, pain intensity, and sleep disturbances in diabetic individuals.

Materials and Methods: A true-experimental, pre-test and post-test design was employed to assess the effectiveness of warm massage therapy in reducing RLS symptoms among diabetic patients. The study was conducted at Narayana Medical College Hospital, Nellore, with a sample of 100 diabetic individuals experiencing RLS, selected through a probability simple random sampling technique. Data were collected using standardized tools, including the International Restless Legs Syndrome Study Group (IRLSSG) Rating Scale, the Pittsburgh Sleep Quality Index, and the Visual Analogue Scale for pain assessment. The intervention group received warm massage therapy, while the control group did not. Pre-test and post-test measurements were analyzed using statistical methods.

Results: The findings revealed a significant reduction in RLS severity, with 85% of participants initially experiencing very severe RLS symptoms, which improved to 89% reporting only moderate symptoms post-intervention. Sleep quality also improved, with 89% of participants achieving good sleep quality post-intervention compared to 98% reporting very poor sleep quality at baseline. Additionally, pain intensity reduced markedly, with 91% of participants experiencing only mild pain post-intervention compared to 38% reporting severe pain in the pre-test.

Conclusion: Warm massage therapy proved to be an effective, non-invasive intervention for managing RLS symptoms among diabetic individuals. It significantly reduced RLS severity, improved sleep quality, and alleviated pain. These findings suggest that incorporating warm massage into diabetes care can enhance patients' quality of life.

Keywords: Restless Legs Syndrome, Diabetes Mellitus, Warm Massage, Sleep Quality, Pain Management, Non-Pharmacological Intervention

INTRODUCTION

Diabetes is a long-term metabolic disorder that leads to persistently high blood sugar levels. Among its types, Type 2 diabetes is the most common, primarily affecting adults due to insulin resistance or insufficient insulin production. Type 1 diabetes, also known as juvenile diabetes, is a chronic condition in which the pancreas either does not produce insulin or produces it inadequately. Diabetes mellitus (DM) is a growing global health concern, with approximately 425 million people affected worldwide, and this number is projected to rise to 628 million by 2045. Uncontrolled diabetes can lead to complications affecting various organs, including the feet, bones, kidneys, and eyes, collectively referred to as diabetic complications.

Restless Legs Syndrome (RLS), also known as Willis-Ekbom Disease, is a neurological condition characterized by uncomfortable sensations such as throbbing, creeping, or pulling in the legs, along with an uncontrollable urge to move them. Symptoms tend to worsen in the evening or at rest,

often interfering with sleep. Temporary relief is typically achieved through movement. The sensations associated with RLS vary in intensity from mild discomfort to significant pain and are often described as paresthesias (abnormal sensations) or dysesthesias (unpleasant abnormal sensations).

RLS is classified as a movement disorder since affected individuals feel compelled to move their legs to alleviate symptoms. More than 80% of individuals with RLS also experience periodic limb movement of sleep (PLMS), a condition characterized by involuntary leg twitching or jerking during sleep, occurring at intervals of 15 to 40 seconds throughout the night. This results in frequent awakenings and disrupted sleep patterns. Although PLMS commonly coexists with RLS, not everyone with PLMS develops RLS. A hallmark feature of RLS is the worsening of symptoms at night, followed by symptom relief in the early morning, which allows for more restful sleep. Certain situations, such as prolonged inactivity during long car rides, flights, or sitting in a theater, can also trigger symptoms.

Lifestyle modifications may help manage mild to moderate RLS symptoms. These include reducing the intake of caffeine, alcohol, and tobacco, ensuring adequate levels of iron, folate, and magnesium, establishing a consistent sleep routine, engaging in moderate exercise, and using relaxation techniques such as leg massages, warm baths, or the application of heat or cold therapy. During clinical and community practice, it has been observed that many individuals with RLS endure symptoms for an extended period without awareness of the condition or available treatment options. This highlights the need for greater awareness and effective management strategies to improve patients' quality of life.

Need for the study:

WORLDWIDE

Restless Legs Syndrome (RLS) is more prevalent among individuals with diabetes mellitus (DM) compared to the general population. Studies indicate that 20-40% of diabetic individuals experience RLS, whereas its prevalence in the general population is estimated at 5-10%. Factors such as poor blood sugar control, diabetic neuropathy, and other complications may contribute to this increased risk. However, prevalence rates vary depending on factors such as geographic location, type of diabetes, and study methodologies. Understanding the link between diabetes and RLS is essential for improving patient care, particularly in regions where diabetes is becoming increasingly common.

INDIA

The prevalence of RLS among individuals with diabetes in India follows global trends, with estimates ranging from 20-30% and reaching up to 35-40% in certain diabetic subgroups. Poor glycemic control and diabetes-related complications, including neuropathy, are likely contributing factors. However, data on the exact prevalence of RLS among diabetic individuals in India remain limited. Given the high burden of diabetes in the country—estimated at over 74 million cases in 2021—further research is needed to establish more precise figures on the coexistence of diabetes and RLS in the Indian population.

ANDHRA PRADESH

Specific studies focusing on the prevalence of RLS among diabetic individuals in Andhra Pradesh are scarce. However, research from South India suggests that RLS affects 20-30% of people with diabetes, with some studies indicating rates as high as 35% in certain groups. Factors such as regional demographics, prevalence of diabetic neuropathy, and lifestyle habits may influence these figures. Since diabetes is a significant health concern in Andhra Pradesh, with an overall prevalence of 8.4% (rural: 6.3%, urban: 12.6%), more localized studies are needed to determine the exact burden of RLS in diabetic individuals within the state.

NELLORE

Limited data are available regarding the prevalence of RLS among diabetic individuals in Nellore. Based on national and regional trends, it is estimated that 20-30% of diabetics in Nellore may experience RLS, with variations based on age, diabetes duration, and disease severity. Home remedies such as warm foot massages have been reported to improve circulation and alleviate RLS symptoms. Considering the potential benefits of such interventions, the investigator aims to evaluate the effectiveness of warm foot massage in reducing RLS severity among diabetic patients.

Objectives of the study:

- To determine the severity of Restless Legs Syndrome (RLS), pain levels, and sleep quality in individuals with Diabetes Mellitus.
- To examine the impact of warm massage on reducing RLS severity, alleviating pain, and enhancing sleep quality in individuals with Diabetes Mellitus.
- Toanalyze the relationship between RLS severity and socio-demographic factors among individuals with Diabetes Mellitus.

Conceptual Framework:
Based on King's Goal Attainment Theory
This study is structured around a modified version of King's Goal Attainment Theory, which emphasizes mutual communication between nurses and patients, goal setting, and collaborative actions to achieve desired health outcomes. The theory is built on personal and interpersonal systems, incorporating key elements such as perception, communication, judgment, action, and transaction.

Perception
The investigator evaluates the impact of warm massage on Restless Legs Syndrome (RLS) in individuals with Diabetes Mellitus by assessing their symptoms, pain levels, and sleep quality.

Communication
A therapeutic relationship is established through effective communication with individuals experiencing RLS and Diabetes Mellitus, ensuring mutual understanding and trust.

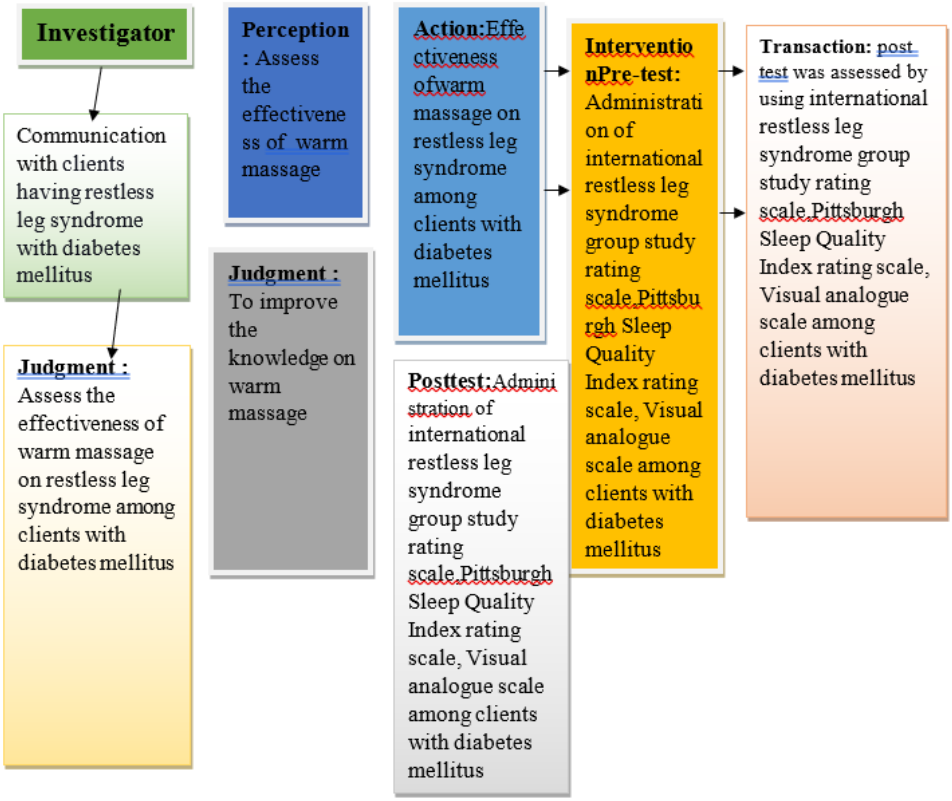
Judgment
The investigator identifies a knowledge gap regarding the effectiveness of warm massage as a non-pharmacological intervention for managing RLS symptoms in diabetic clients.

Action
Planning and decision-making involve setting study objectives, selecting appropriate assessment tools, and implementing warm massage therapy for individuals with RLS and Diabetes Mellitus.

Interaction
The investigator administers assessment tools, including the International Restless Legs Syndrome Study Group Rating Scale, the Pittsburgh Sleep Quality Index, and the Visual Analogue Scale, to evaluate RLS severity, sleep disturbances, and pain intensity. Warm massage therapy is then provided as an intervention.

Transaction
During the pre-test, the investigator assesses participants' baseline RLS severity, pain levels, and sleep quality using the selected rating scales. After administering warm massage therapy, a post-test is conducted using the same tools to measure improvements. This framework helps evaluate the effectiveness of warm massage therapy in alleviating RLS symptoms among diabetic individuals.
By adopting this model, the study systematically examines how warm massage contributes to symptom relief, pain reduction, and improved sleep quality in individuals with RLS and Diabetes Mellitus.

FIG NO.1: CONCEPTUAL FRAMEWORK BASED ON MODIFIED KING'S GOAL ATTAINMENT THEORY (1960)



METHODS & MATERIALS

Research approach:

Quantitative research approach was utilized to assess the effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus at selected hospitals Nellore

Research design

True – Experimental Design in that Pre-test and Post test design was adopted to assess the effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus.

Experimental group	O1	X	O2
Control group	O1	-	O2

O1:Pre-test
X-Treatment
O2: Post-test

Study Setting:

This study was conducted in selected Hospital, Narayana Medical College Hospital, Nellore, AP.

In 2022 report indicated that Nellore city had approximately 45,000 diabetic patients, with about 100,000 more in the surrounding district. These patients were receiving treatment at various facilities, including NarayanaMedical College Hospital.

Population:

Target population:

The target population for the present study includes all clients with Diabetes Mellitus.

Accessible population:Restless Leg Syndrome of clients with Diabetes Mellitus in the selected hospital, Nellore.

Sample

Restless Leg Syndrome of clients with Diabetes Mellitus, those who fulfill the inclusion criteria.

Sampling technique:Probability Computer assisted Simple Random Technique

Sample size:100 clients with Diabetes Mellitus

Sample size calculation:

The estimated sample size for the present study was100 as calculated by using the Yamens formula: $n=N/1+N(e)^2$.

Criteria for sample selection

Inclusion criteria:

Clients who are;

- ✓ Having RLS among DM
- ✓ at the age group between 45 – 75 years.
- ✓ not currently participating in another diabetes self-management program.

Exclusion criteria:

Clients who;

- ✓ Severe diabetic complication like diabetic foot
- ✓ Neurological disorders like Parkinson's disease
- ✓ Who have undergone for surgery
- ✓ Skin infections
- ✓ Receiving any other massage therapy
- ✓ Allergies of any massage oil
- ✓ Any other clinical trials

Variables of the study

Independent variables :Warm Massage

Dependent variables :Restless Leg Syndrome

Description of the tool:

Part A:SocioDemographic data

Part B: The International Restless Legs Syndrome Study Group (IRLSSG) Rating Scale

Part C: Pittsburgh Sleep Quality Index Rating Scale

Part D: Visual Analogue Scale to assess Pain Intensity

Score interpretation

1. The International Restless Legs Syndrome Study Group (IRLSSG) Rating Scale

The IRLSSG Rating Scale is a questionnaire that consists of 10 items designed to measure the severity and impact of RLS symptoms over the past week. Each item is scored on a scale from 0 to 4, with higher scores indicating more severe symptoms.

The response options for each item typically range from "none" (0) to "very severe" (4).

Total Score	RLS Severity
0-10	Mild RLS
11-20	Moderate RLS
21-30	Severe RLS
31-40	Very severe RLS

2. Pittsburgh Sleep Quality Index Rating Scale

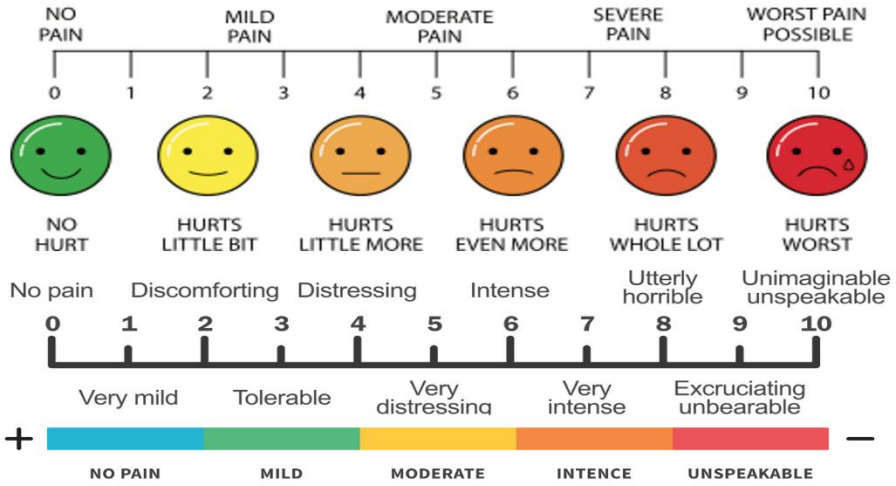
The PSQI is a self-administered questionnaire, typically completed by the participant. It includes 19 items, some of which are multiple-choice questions, while others require participants to write in their responses.

Each of the seven components is scored on a scale from 0 to 3, where:

- 0: No difficulty
- 1: Mild difficulty
- 2: Moderate difficulty
- 3: Severe difficulty

Total Score	Sleep Quality
0-10	Good sleep quality
11-25	Poor sleep quality
26-45	Very poor sleep quality

3. Visual Analogue Scale to assess Pain Intensity



The Visual Analogue Scale (VAS) is a widely used tool to measure pain intensity.

0 cm	No pain
1-3 cm	Mild pain
4-6 cm	Moderate pain
7-10 cm	Severe pain

Content validity:Content validity of the tool was obtained from 10 experts from different fields like Medical surgical nursing, Community Health nursing and General Medicine. Minor modifications given by the experts were incorporated in the demographic variables..

Reliability:The reliability of the tool was analysed by using the split- half method. R=2r/1+r. The R value was R'=0.86.

Feasibility: The feasibility of the tool was tested by conducting a pilot study.

Ethical clearance: Obtained from Institutional Ethical Committee of Narayana college of nursing, Nellore.

Consent:was obtained from the research participants before the data collection.

Autonomy: All participants was considered to make rational and moral decisions during the study.

Justice: The study was useful for the patient with both restless leg syndrome and diabetes mellitus at Narayana Medical College Hospital at Nellore

Beneficence: The practice of warm massage during the study period among the participants was for achieving the ultimate research goal and should be strictly complied with, for the benefit of participants.

Non-Maleficence: No intended act of committing harm to the research participants.

Validity: Maintain trust relationship between the investigator and samples.

Pilot study:

A pilot study was conducted for one week in a selected Hospital at Nellore. After obtaining formal permission, 10 participants who met the inclusion criteria was selected by simple random sampling technique. Data collection procedure was followed as pre-test, intervention and post-test. Based on the experience and feasibility of the pilot study, the investigator will proceed to the final study

Intervention and Protocol

Place	Narayana Medical College Hospital
Duration of data collection	2 weeks
Number of participants	100 participants
Duration of data period	2 weeks

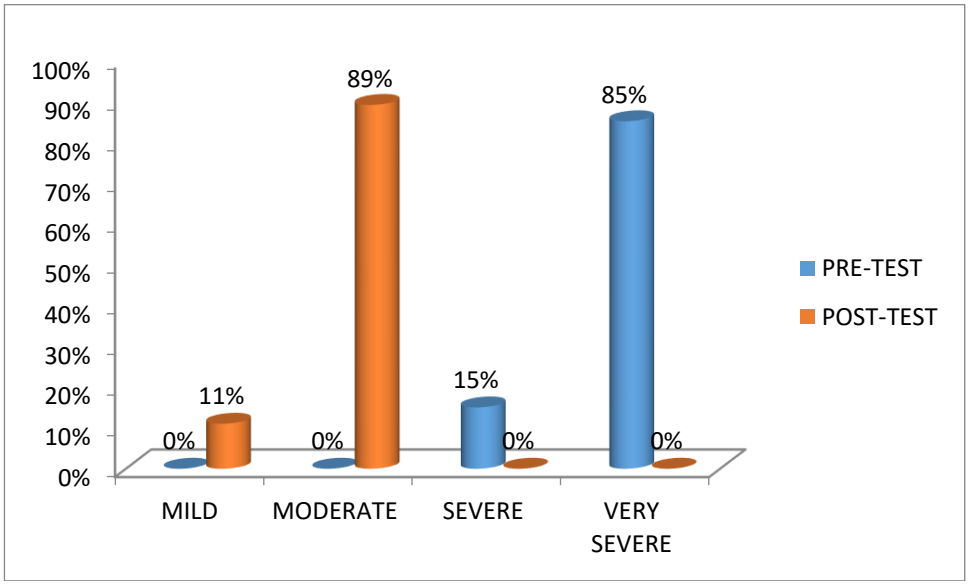
RESULTS

FREQUENCY AND PERCENTAGE DISTRIBUTION BASED ON EFFECTIVENESS OF WARM MASSAGE ON RESTLESS LEG SYNDROME AMONGCLIENTS WITH DIABETES MELLITUS

INTERNATIONAL RESTLESS LEGS SYNDROME STUDY GROUP RATING SCALE

Severity	PRE-TEST		POST-TEST	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
MILD RLS	-	-	11	11%
MODERATE RLS	-	-	89	89%
SEVERE RLS	15	15%	-	-
VERY SEVERE RLS	85	85%	-	-
Total	100	100%	100	100%

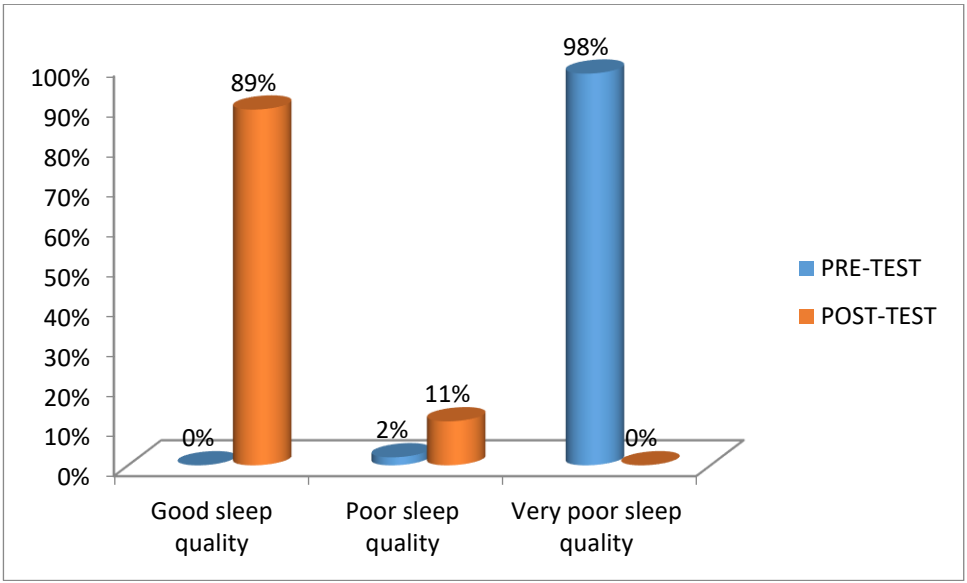
Discussion on effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus pre - test, 15%(15) had severepain and 85(85%) had very severe pain.Post-test ,11(11%) had mild severity and 89(89%) had moderate severity.



PITTSBURGH SLEEP QUALITY INDEX RATING SCALE

SLEEP QUALITY	PRE-TEST		POST-TEST	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Good sleep quality	-	-	89	89%
Poor sleep quality	2	2%	11	11%
Very poor sleep quality	98	98%	-	-
Total	100	100%	100	100%

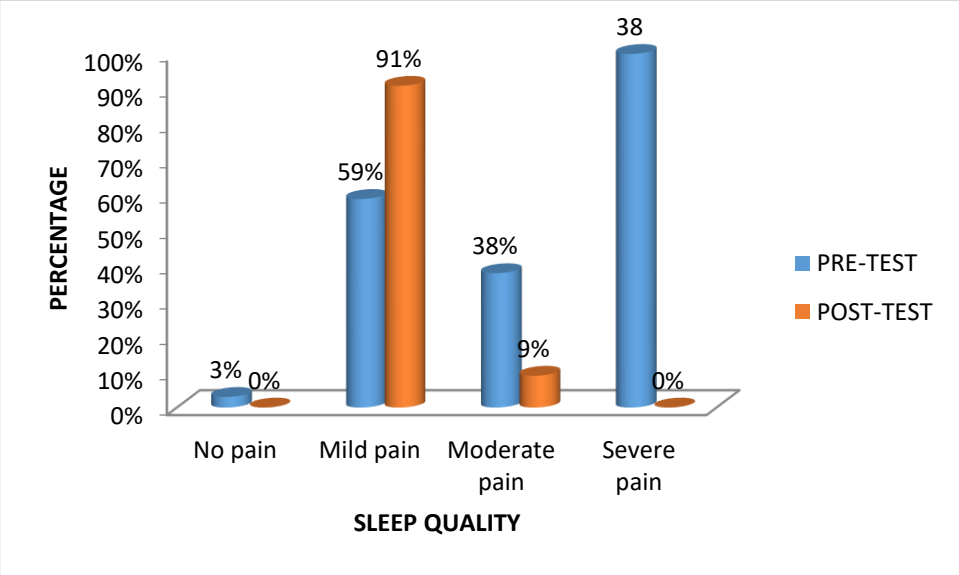
Discussion on effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus pre - test, 2(2%) had poor sleep quality and 98(98%) had very poor sleep quality. Post-test ,89(89%) had good sleep quality and 11(11%) had poor sleep quality.



VISUAL ANALOGUE SCALE

PAIN INTENSITY	PRE-TEST		POST-TEST	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
No pain	-	-	-	-
Mild pain	3	3%	91	91%
Moderate pain	59	59%	9	9%
Severe pain	38	38%	-	-
Total	100	100%	100	100%

Discussion on effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus pre - test, 3(3%) had mild pain, 59(59%) had moderate pain and 38(38%) had severe pain. Post-test ,91(91%) had mild pain and 9(9%) had moderate pain.



SECTION – I

FREQUENCY AND PERCENTAGE DISTRIBUTION OF SOCIO DEMOGRAPHIC VARIABLES AMONG CLIENTS WITH DIABETES MELLITUS.

Table – 1 Frequency and Percentage distribution of clients with diabetes mellitus with their based on age group(n=100)

Age	Frequency(f)	Percentage (%)
a)45-55years	44	44
b)55-65years	38	38
c)65-75years	18	18
TOTAL	100	100

Table No.1: Demonstrate that the clients age, 44(44%) are between 45-55years, 38(38%) are between 55-65 years and 18(18%) are between 65-75 years of age.

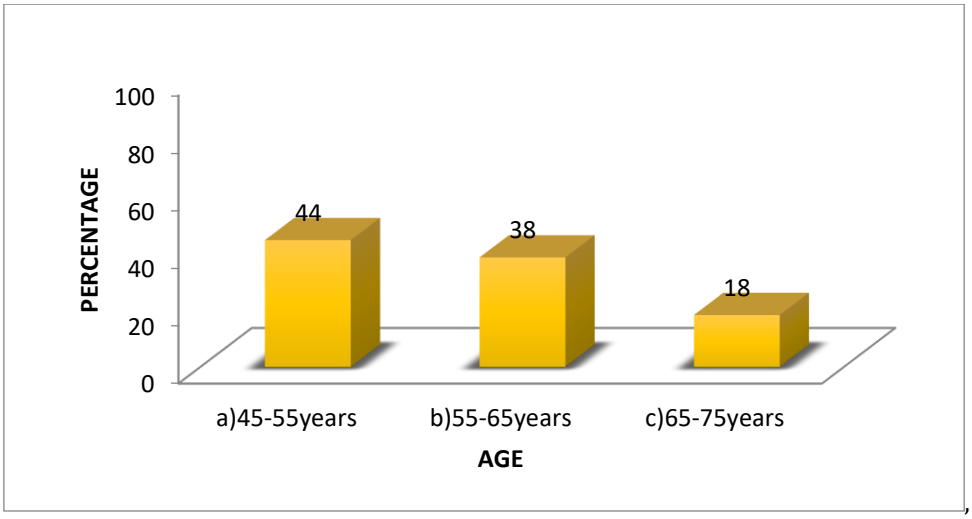


Fig no.1: Percentage distribution of clients based on age.

Table-2:Frequency and percentage distribution of clients with diabetes mellitus based on gender (n=100)

Gender	Frequency (f)	Percentage (%)
a) Male	59	59
b) Female	41	41
Total	100	100

Table No.2:Shows that in clients gender majority of 59(59%) are males and 41(41%) are females.

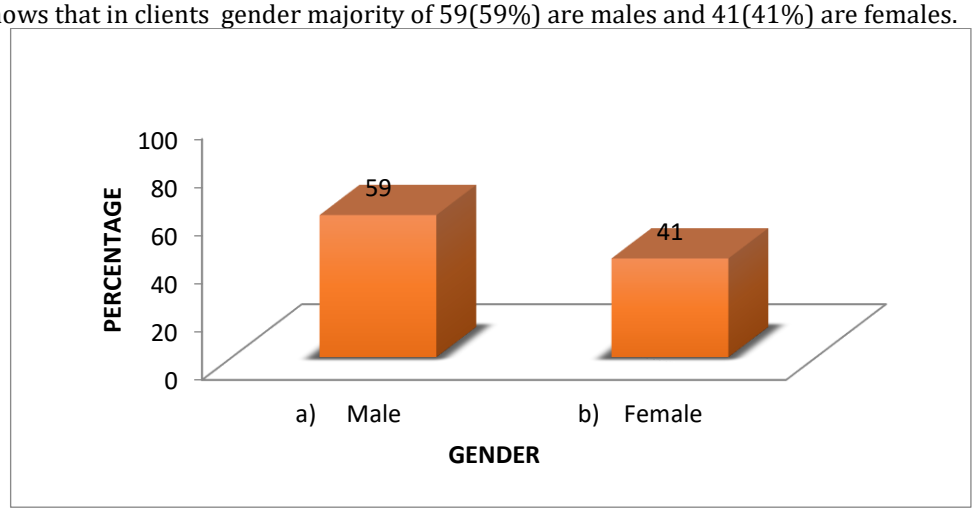


Fig no.2: Percentage distribution of clients based on gender

Table –3: Frequency and Percentage distribution of clients with diabetes mellitus based on marital status(n=100)

Marital status	Frequency (f)	Percentage (%)
a)Single	2	2
b)Married	90	90
c)Unmarried	2	2
d)Widow	6	6
Total	100	100

Table No.3: Specify that patient marital status , 2(2%) are single,90(90%) are married, 2(2%) are Unmarried, 6(6%) are widows.

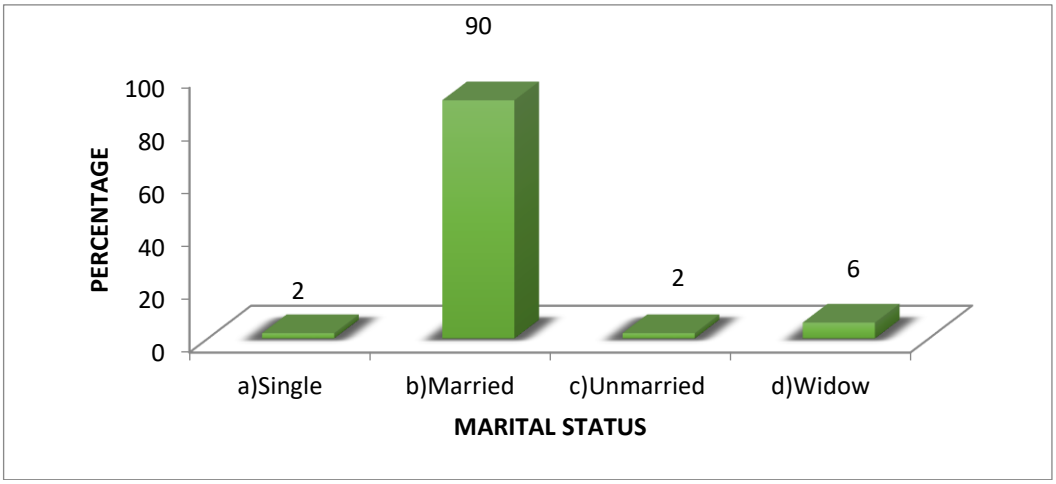


Fig no.3: Percentage distribution of clients based on marital status.

Table –4: Frequency and Percentage distribution of clients withdiabetes mellitus based on education(n=100)

Educational status	Frequency (f)	Percentage (%)
a) No formal education	52	52
b) Primary education	37	37
c) secondary education	10	10
d)Graduate/Post graduate	1	1
TOTAL	100	100

Table No.4: Indicates that the clients educational status, 52(52%) are no formal education, 37(37%) are primary education, 10(10%) are secondary education and 1(1%) are graduates and post graduates

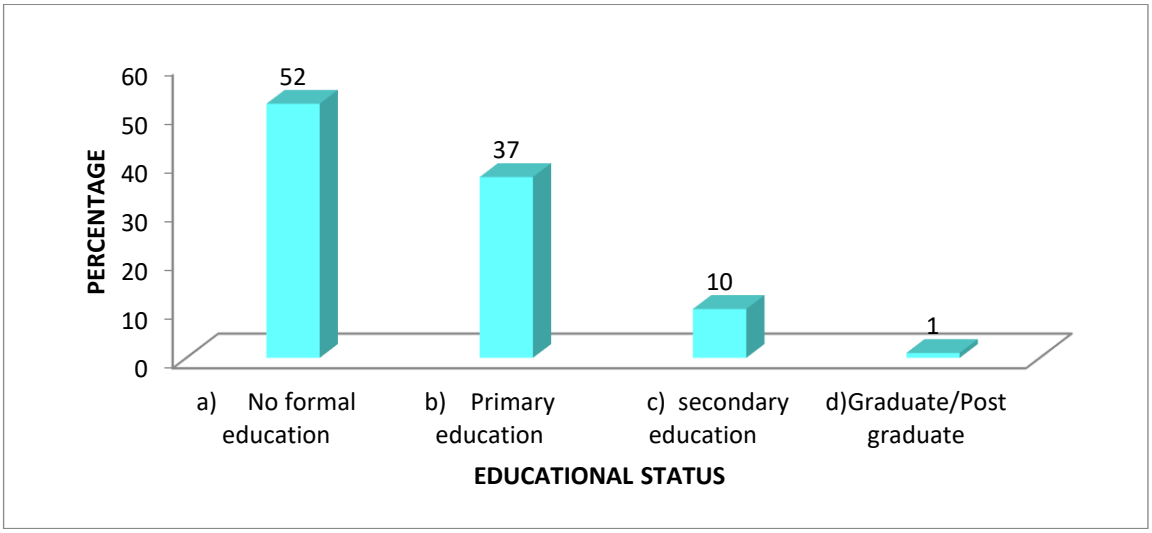


Fig no.4: Percentage distribution of clients based on educational status

Table –5: Frequency and Percentage distribution ofclients with diabetes mellitus based on employment. (n=100)

Employment	Frequency (f)	Percentage (%)
a) Unemployed	27	27
b) Coolie	58	58
c) Government employee	3	3
d) Private employee	12	12
TOTAL	100	100

Table No. 5: Illustrates about clients employment, 27(27%) are unemployed, 58(58%) are Coolie, 3(3%) are government employees, and 12(12%) are private employees.

Fig no.5: Percentage distribution of clients based on employment

Table –6: Frequency and Percentage distribution of clients with diabetes mellitus based on place of residence. (n=100)

Place of residence	Frequency (f)	Percentage(%)
a) Urban	53	53
b) Rural	47	47
Total	100	100

TableNo.6: Highlights the residence of clients that majority 53(53%) are living in urban areas and 47(47%) are living in rural areas

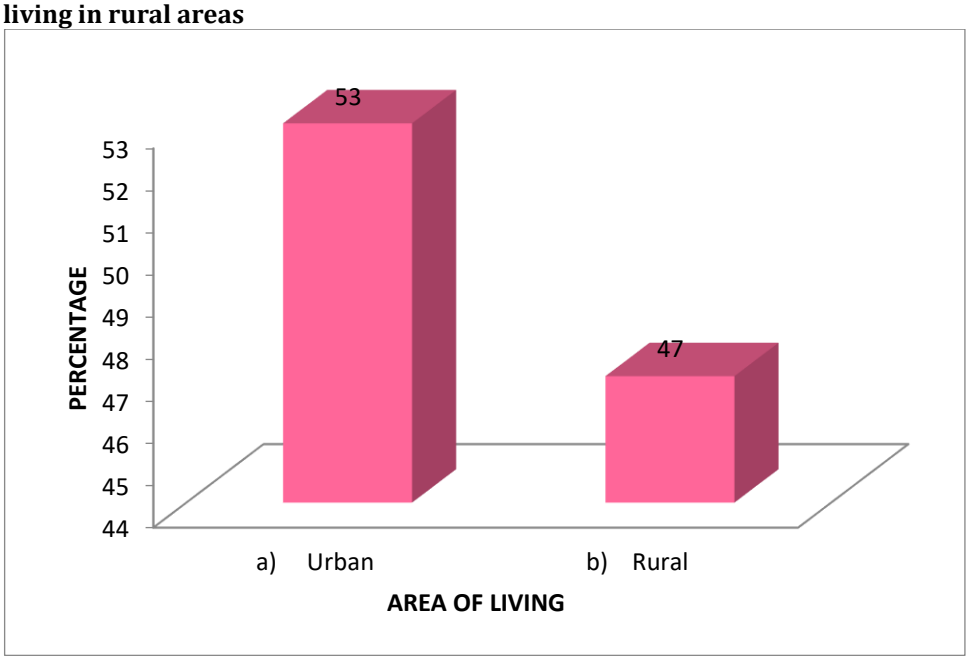


Fig no.6: Percentage distribution of clients based on place of residence

Table–7: Frequency and Percentage distribution of clients with diabetes mellitus based on household income (n=100)

Household income	Frequency(f)	Percentage(%)
a)<2lakhs/year	78	78
b)2-6lakhs /year	20	20
c)6-10lakhs/year	2	2
Total	100	100

Table No.7: Presents the clients household income, 78(78%) are earning <2 lakhs per year, 20(20%) are earning 2- 6 lakhs per year, 2(2%) are earning 6-10 lakhs per year.

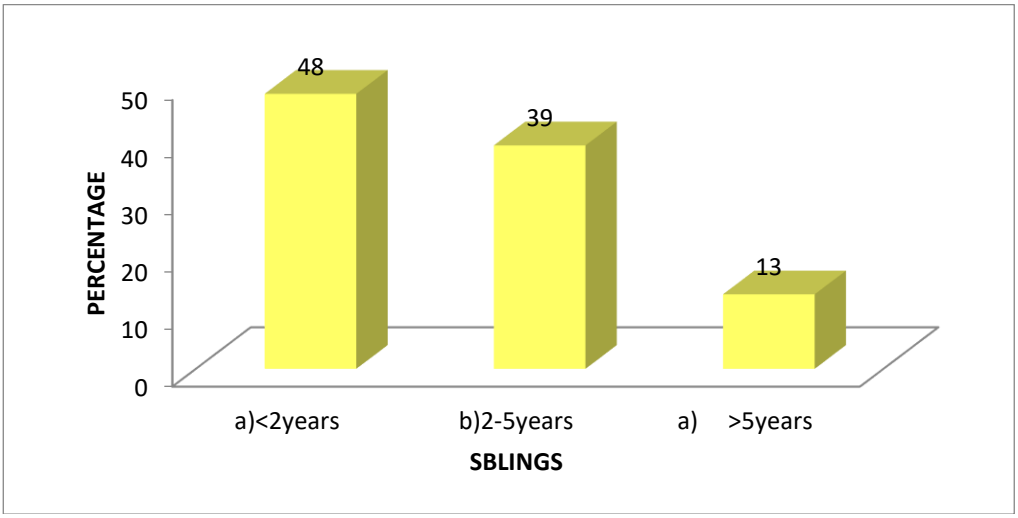


Fig no.7: Percentage distribution of clients based on household income

Table –8: Frequency and Percentage distribution of clients with diabetes mellitus based on duration of diabetes mellitus (n=100)

Duration of Diabetes Mellitus	Frequency (f)	Percentage (%)
a)<2years	48	48
b)2-5years	39	39
c) >5years	13	13
TOTAL	100	100

Table No.8: portrays the about clients duration of diabetes mellitus, 48(48%) are <2 years, 39(39%) are 2-5 years and 13(13%) are > 5 years.

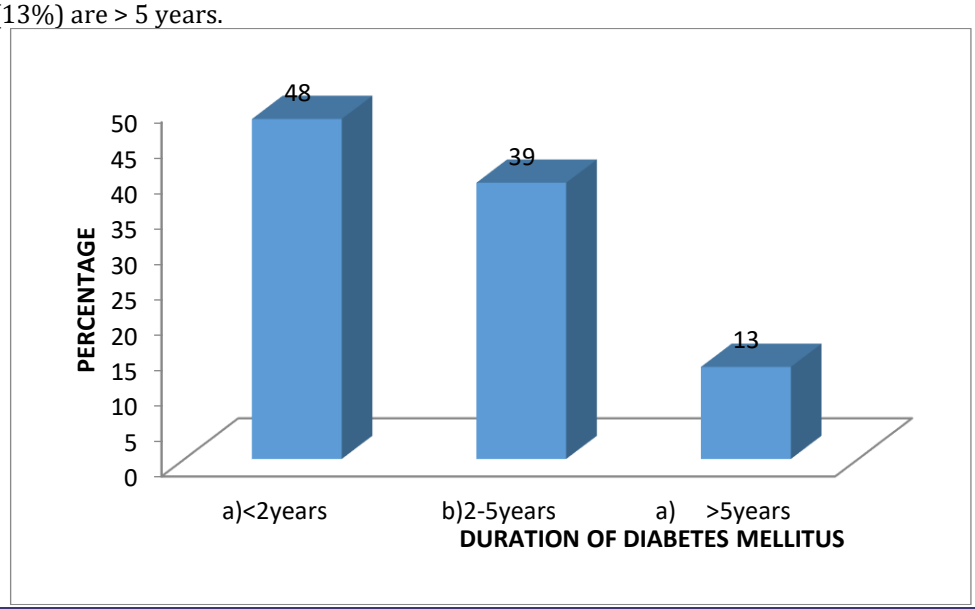


Fig no.8: Percentage distribution of clients based on duration of diabetes mellitus

Table –9: Frequency and Percentage distribution of clients with diabetes based on complaints of RLS (n=100)

Complaints of RLS	Frequency (f)	Percentage(%)
a)Yes	66	66
b)No	34	34
Total	100	100

TableNo.9: Projects theclients having complaints of RLS and majority of 66(66%) are having complaints and 34(34%) are not having complaints

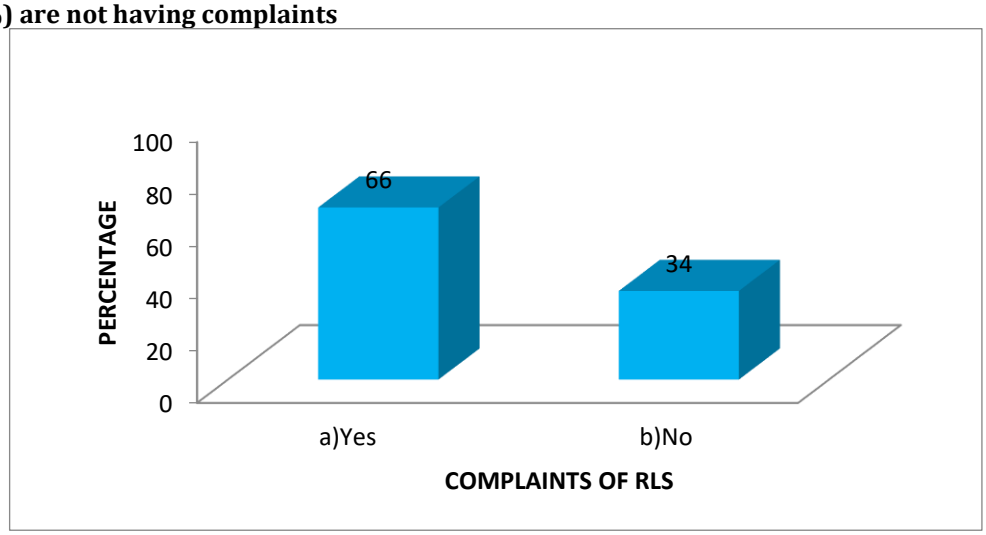


Fig no.9: Percentage distribution of clients based on complaints of RLS

Table–10: Frequency and Percentage distribution of Clients with diabetes mellitus based on diabetes related medications use(n=100)

Diabetes related medications use	Frequency(f)	Percentage(%)
a) Oral anti hyperglycemic drugs	72	72
b) Insulin	21	21
c) Both a&b	7	7
Total	100	100

Table No.10: Discusses about the clients diabetes related medications use, 72(72%) are using oral hyperglycemic drugs, 21(21%) are use insulin and 7(7%) are using both hyperglycemic drugs and insulin.

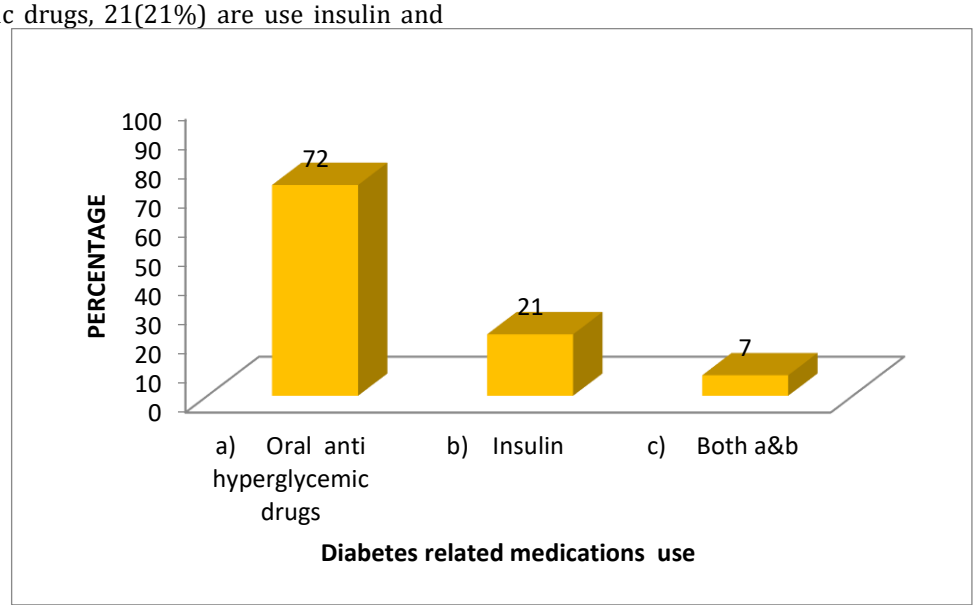


Fig no.10: Percentage distribution of clients based on diabetes related medications use

SECTION -III

Mean and Standard Deviation of assess effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus (n=100)

Criteria	Pre test		Post test		T-Test
Asses the effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus based on international RLS study group rating scale	Mean	SD	Mean	SD	
	52.35	1.24	64.25	2.48	CV=76.22 Tv=16.24 Df=2 P<0.05

Mean and standard deviation, 't' ratio of pretest and post-test of knowledge towards warm massage on restless leg syndrome among clients with diabetes mellitus based on international RLS study group rating scale. The post testscore was 64.25, with SD 2.48. The pre testscorewas52.35 with an SD of 1.24.

The calculated 't' Value (76.22) is more than the tabulated Z value (16.24) at 0.05 level of significance. Thus, from the conformation of result from the above table, the Research hypothesis which reads as "**there was a significant difference between** warm massage on restless leg syndrome among clients with diabetes mellitus based on visual analogue scale is accepted.Hence the **Null hypothesis was rejected**, and the **Research hypothesis was accepted**.

Criteria	Pre test		Post test		T - Test
Asses the effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus based on Pittsburgh Sleep Quality Index Rating Scale	Mean	SD	Mean	SD	
	9.06	1.25	12.24	2.06	CV=42.36 Tv=36.22 Df=2 P<0.05

Mean and standard deviation, 't' ratio of pretest and post-test of Pittsburgh Sleep Quality Index Rating Scale on restless leg syndrome among clients with diabetes mellitus The post test score was 12.24, with SD 2.06. The pre- test score was 9.06 with an SD of 1.25.

The calculated 't' Value (42.36) is more than the tabulated Z value (36.22) at 0.05 level of significance. Thus, from the conformation of result from the above table, the Research hypothesis which reads as "**there was a significant difference between** warm massage on Sleep quality among clients with diabetes mellitus based onPittsburgh Sleep Quality Index Rating Scale.

Criteria	Pre test		Post test		T - Test
Asses the effectiveness of warm massage on restless leg syndrome among clients with diabetes mellitus based on visual analogue scale	Mean	SD	Mean	SD	
	10.24	1.24	8.062	1.34	CV=41.23 Tv=25.33 Df=2 P<0.05

Mean and standard deviation, 't' ratio of pretest and post-test of knowledge towards warm massage on restless leg syndrome among clients with diabetes mellitus based on visual analogue scale . The

pretestscorewas 10.24, with SD 1.24. The post- test score was 8.062 with an SD of 1.34.

The calculated 't' Value (41.23) is more than the tabulated Z value (25.33) at 0.05 level of significance. Thus, from the conformation of result from the above table, the Research hypothesis which reads as "**there was a significant difference between** warm massage pain severity among clients with diabetes mellitus based on visual analogue scale.

SECTION – IV Association between the assess on effectiveness of warm massage on restless leg syndrome among patients with diabetes mellitus with their selected Socio demographic variables and international RLS study group rating scale

	Mild		Moderate		
	F	%	F	%	
Age					
a)45-55years	15	15	10	10	CV=**3.246753** **TV=6.36** **Df=2** **P<0.05** **NS**
b)55-65years	25	25	15	15	
c)65-75years	15	15	20	20	
Gender					CV= **9.090909** **TV=5.23** **Df=1** **P<0.05** **S**
a) Male	35	35	20	20	
b) Female	15	15	30	30	
Marital status					CV=**10.134310** **TV=8.26** **Df=3** **P<0.05** **S**
a)Single	10	10	5	5	
b)Married	35	35	10	15	
c)Unmarried	10	10	5	5	
d)Widow	10	10	15	15	
Educational status					CV=**3.298565** **TV=8.63** **Df=3** **P<0.05** **NS**
a)No formal education	25	25	10	10	
b)Primary education	15	15	5	15	
c)Secondary education	12	12	10	10	
d)Graduate/Post graduate	13	13	10	10	
Employment					CV= **5.340816** **TV=8.969** **Df=3** **P<0.05** **NS**
a) Unemployed	15	15	5	5	
b) Coolie	20	20	15	15	
c) Government employee	10	10	12	12	
d) Private employee	10	10	13	13	
Place of residence					CV= **0.673401** **TV=4** **Df=1** **P<0.05** **NS**
a) Urban	35	35	20	20	
b) Rural	25	25	20	20	
Household income					CV= **3.846154** **TV=6.33** **Df=2** **P<0.05** **NS**
a)<2lakhs/year	25	25	15	15	
b)2-6lakhs /year	30	30	10	15	
c)6-10lakhs/year	10	10	10	10	
Duration of Diabetes Mellitus					**CV=7.081014** **TV=4.223** **Df=2** **P<0.05** **S**
a)<2years	35	35	20	20	
b)2-5years	30	30	5	5	
c)>5years	5	5	5	5	
Complaints of RLS					**CV= 1.515152** **TV=0.25** **Df=1**
a)Yes	30	30	30	30	
b)No	25	25	15	15	

Total	55	55	45	45	**P<0.05 S**
Diabetes related medications use					**CV= 0.694444 TV=2.02 Df=2 P<0.05 NS**
a) Oral antihyperglycemic drugs	45	45	30	30	
b) Insulin	10	10	5	5	
c) Both a&b	5	5	5	5	

Note :

NS= Non Significant
TV= Table Value
CV= Calculated Value
S=Significant
Df=Degree of Freedom
P<0.05 level of significant

- In relation to age, calculated value is 3.246 and table value is 6.36 the calculated value is less than table value, so there is non significant association.
- With associated to gender, calculated value as 9.090and table value is 5.23.The calculated value is greater than table value, so there issignificant association.
- with show to marital status, calculated value is 10.134 and table value is 8.26 The calculated value is greater than table value, so there is significant association
- with reference to educational status, calculated value is 3.298 and table value is 8.63. The calculated value is less than table value, so there is non significant association.
- with context to employment, calculated value is 5.340 and table value is8.969 . The calculated value is less than table value, so there is non significant association.
- in accordance to place of residence, calculated value is 0.673 and table value is 4 . The calculated value is less than table value, so there is non significant association.
- Regarding household income, calculated value as 3.846 and table value is 6.33 . The calculated value is less than table value, so there is non significant association.
- with reference to duration of diabetes, calculated value as 7.081 and table value as and table value is 4.223 . The calculated value is greater than table value, so there is significant association.
- In relation to complaints of RLS, calculated value is 1.515 and table value is 0.25 The calculated value is greater than table value, so there is significant association.
- with associated to diabetes related medications use, calculated value as 0.694 and table value is 2.02. The calculated value is less than table value, so there is non significant association.

DISCUSSION

This study aimed to evaluate the effectiveness of warm massage in reducing Restless Legs Syndrome (RLS) severity, pain intensity, and sleep disturbances among clients with Diabetes Mellitus at selected hospitals in Nellore. A total of 100 participants were selected using a simple random sampling technique. Data collection involved standardized assessment tools, including the International RLS Study Group Rating Scale, Pittsburgh Sleep Quality Index, and Visual Analogue Scale.

Key Findings:

- Baseline Assessment (Pre-test): The majority of participants experienced severe RLS symptoms, poor sleep quality, and moderate to severe pain intensity.
- Post-Intervention (Post-test): After receiving warm massage therapy, participants showed mild RLS severity, improved sleep quality, and reduced pain intensity.
- Statistical Analysis: A significant improvement was observed between pre-test and post-test scores, confirming the effectiveness of warm massage therapy.
- Association with Socio-Demographic Variables: Gender, marital status, duration of diabetes, and presence of RLS symptoms showed a significant association with the effectiveness of warm massage. However, variables such as age, education, employment, place of residence, household income, and diabetes-related medication use did not show a statistically significant impact.

Conclusion

The study concludes that warm massage therapy is an effective non-pharmacological intervention for managing RLS symptoms, improving sleep quality, and reducing pain intensity among diabetic individuals. The post-test findings demonstrated a moderate reduction in RLS severity, good sleep quality, and mild pain intensity. The statistical analysis further validated the impact of warm massage in alleviating symptoms. Given these results, warm massage can be recommended as an adjunct therapy in nursing care for diabetic clients experiencing RLS.

KEY MESSAGE

1. High Prevalence of RLS in Diabetes: The study highlights that Restless Leg Syndrome (RLS) is significantly prevalent among diabetic individuals, with rates reaching up to 40% in some groups, necessitating focused management strategies.
2. Impact on Sleep and Pain: RLS in diabetic patients leads to poor sleep quality and increased pain intensity, further affecting their overall well-being and daily functioning.
3. Effectiveness of Warm Massage: The findings confirm that warm massage is an effective non-pharmacological intervention, significantly reducing RLS severity, improving sleep quality, and alleviating pain.
4. Cost-Effective and Simple Intervention: Warm massage provides a practical, low-cost, and easily implementable therapy for diabetic patients suffering from RLS, making it a feasible option in clinical and home-based care settings.
5. Need for Integration into Diabetes Management: Given the positive outcomes, incorporating warm massage into routine diabetes care may enhance the quality of life for diabetic individuals, supporting holistic and patient-centered treatment approaches.

The study was accorded Ethical Committee Approval vide Ethics Committee (Narayana College of Nursing) No.Lt. No: NCON/2023-2024/M.Sc/03 dated _13-08-2024.

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