

## **“A Prospective Non-Randomized Experimental Study to Compare Results of Btpb and Polarity Analysis Software in Cases of Osteoarthritis using Womac Index.”**

**Dr. Thakur Ashwini<sup>1</sup>, Dr. Priya. Sheth<sup>2</sup>**

Bharati Vidyapeeth (Deemed to be University) Homoeopathic Medical College,  
Dept. Of Post Graduate & Research Centre, Pune-Satara Road,  
Katraj, Dhankawadi, Pune, India – 411043  
Department of Homoeopathic Repertory

<sup>1</sup>Post-Graduate, Department of Homoeopathic Repertory,  
Bharati Vidyapeeth (Deemed to be University), Homoeopathic medical college and Hospital, Pune -  
SataraRoad-411043.

<sup>2</sup>Assistant Professor, Department of Homoeopathic Repertory,  
Bharati Vidyapeeth (Deemed to be University), Homoeopathy medical college and Hospital, Pune -Satara  
Road-411043.

Corresponding Author: Dr. Priya. Sheth

Assistant Professor, Department of Homoeopathic Repertory, Bharati Vidyapeeth (Deemed to be University),  
Homoeopathy medical college and Hospital, Pune -Satara Road-411043.

### **Abstract:**

#### **Introduction:**

Osteoarthritis is a long-term chronic disease characterized by deterioration of cartilage in joints which results in bones rubbing together and creating stiffness, pain, and impaired movements.

The disease most commonly affects the joints in the knees, hands, and feet and is relatively common in the shoulder and hip joints.

While osteoarthritis is related to aging, it is associated with a variety of risk factors including obesity, lack of exercise, genetic predisposition, bone density, occupational injury, trauma, and gender.

Primary osteoarthritis is a condition in which the protein makeup of cartilage decreases with age, repetitive use of joints over the years causes damage to the cartilage that leads to joint pain and swelling.

Secondary osteoarthritis is mostly caused by another underlying disease for ex: Osteoarthritis due to obesity, repeated Trauma or surgery to the abnormal Joints at birth, gout, Rheumatoid arthritis, Diabetes mellitus & other hormonal disorders.

This study aims to show the utility of homeopathic medicines on the patients suffering from Osteoarthritis, and to compare the results of Polarity Analysis Software and BTPB in the management of Osteoarthritis, Using WOMAC score for before and after intervention Comparison.

#### **Materials and method**

30 patients, in the age group of 30 to 70 years, diagnosed with Osteoarthritis, were selected to conduct this study.

Out of the 30 patients, 57% of patients were females and 43% were males in the study.

The changes were evaluated before and after treatment. Response to treatment was determined by WOMAC Index which includes pain, stiffness and ADL, before and after the treatment.

After careful examination, study, and repertorization with the help of Boenninghausen therapeutic pocket book and polarity analysis each of the 15 cases was analyzed by using both the repertories, and the similimum was prescribed to the patients.

#### **Results:**

In this study, total of 32 Patients have registered out of which 30 patients were able to complete their treatment and 2 cases were dropout, the age group involved in this study is varying from 35-70 years age old

people

Among 30 Patients of 60% of patients had both their knees affected, 20% of had their left knee affected and 20% of patients had issues with the right knee. Patients the Distribution of patients according to the Medicine Prescribed for the treatment of knee osteoarthritis. Belladonna, Sulphur, and Kali Carb each of this medicine were prescribed to 10% of patients under study. WOMAC Index was used as the assessment tool, before and after intervention scores were statistically analysed; the pain, stiffness, and functional limitation subcategories were statistically assessed using the 't-test before intervention and after the intervention. Here average "WOMAC Score Difference" is compared for both Repertory BTPB and Polarity Analysis. When BTPB Repertory is used, the average "WOMAC score difference" is  $28.67 \pm 6.03$  (mean  $\pm$  sd) before and after the intervention of treatment for knee joint pain. When Polarity Analysis is used, the average "WOMAC score difference" is  $35.53 \pm 7.71$  (mean  $\pm$  sd) before and after the intervention of treatment for knee joint pain.

To test the hypothesis: The average "WOMAC score difference", based on BTPB and Polarity analysis treatment is the same, a two-sample t-test is used.

The t-statistic value is -2.72 and the p-value of 0.01\* is significant.

#### **Conclusion:**

The medicines, which were selected and prescribed on the basis of chief complaint, after the repertorization from BTPB and Polarity Analysis software, showed significant result in the treatment of osteoarthritis. Homeopathic medicines obtained after repertorizing from Polarity Analysis software are effective in the treatment of osteoarthritis. The results are supportive to open new paths for future studies on Osteoarthritis and homeopathic treatment. As the sample size was small further studies with larger sample sizes are needed.

#### **Keywords:**

Osteoarthritis, Homoeopathy, Boenninghausen therapeutic Pocket book and polarity analysis software, Dr. Heiner Frei ,Repertory.

#### **Introduction:**

According to the Subcommittee on Osteoarthritis of the American College of Rheumatology Diagnostic and Therapeutic Criteria Committee, an osteoarthritis is a heterogeneous group of conditions that cause joint symptoms and signs and are linked to altered bone at the joint margins and defective integrity of articular cartilage. Osteoarthritis is clinically distinguished by joint discomfort, soreness, restriction of motion, crepitus, sporadic effusion, and varying degrees of local inflammation.[1]

Primary osteoarthritis is a kind of osteoarthritis that is mostly brought on by aging. As a person gets older, cartilage's protein structure deteriorates, and its water content increase. Eventually, cartilage begins to degenerate by exfoliating, forming tiny crevasses. In more severe cases, the cartilage cushion between joints is completely lost. Damage to the cartilage stimulates the creation of additional outgrowths or spurs near the joints. The second type of osteoarthritis, known as secondary osteoarthritis, is brought on by another illness or condition, such as obesity, chronic joint damage

from trauma or surgery, congenitally abnormal joints, gout, rheumatoid arthritis, diabetes, and other hormonal imbalances.[2]

Hip and knee OA was identified as the 11th biggest contributor to global disability in the Global Burden of Disease 2010 research. [3]Osteoarthritis affects about 80% of the population in India, of which 20% reported being unable to do everyday tasks and 11% required care. Over 70% of the population has OA, with roughly 2% of those individuals experiencing significant knee pain and disability. According to ACR clinical criteria, the prevalence of OA was estimated to be 10.2% in Maharashtra, with women substantially more likely to have the disease (11%) than men (7%) in this demographic. The female to male ratio is 65.7% vs. 34.3%, or almost 2:1, when gender comparisons are made.[4]A common sign of knee joint discomfort is soreness around the knee joint. The degree of pain might vary depending on whether it is constant or intermittent (on/off). Commonly seen in OA are troubling signs like locking, swelling, or giving way of the knee. Every pain-related dysfunction is frequently manifested by difficulty carrying out daily tasks, difficulty

walking, or difficulty ascending stairs, which ultimately results in a reduction in quality of life. Knee pain can start out suddenly, then gradually get worse or worsen over time. The most frequent symptoms include stiffness and soreness after lengthy rest or when getting out of bed. Pain may gradually become more persistent at night or when you're resting. Pain frequently gets worse with intensive exertion. Joint discomfort and stiffness after long periods of sitting or rest typically go away in a half-hour, a process known as gelling.[5]

Osteoarthritis of the knee can typically be diagnosed clinically and later radiographically verified. Pain, stiffness, restricted movement, edema, crepitus, and rising age (rare before age 40) in the absence of systemic symptoms (such as fever) are the major characteristics that point to the diagnosis.[6]

The various classification system of OA:

**Clinical:**

Knee discomfort that persisted for the majority of the previous month, together with at least three of the following

1. people who have crepitus with vigorous joint motion
2. those with morning stiffness that lasts no longer than 30 minutes
3. being older than 50 years old
4. a knee examination revealed bony hypertrophy.
5. knee examination revealed bony soreness
6. No discernible warmth.

Clinical and radiographic findings: include knee pain during the majority of the previous month, as well as radiographic evidence of osteophytes on the borders of the joints and one of the following:

1. individuals with crepitus when moving actively
2. those with morning stiffness that lasts no longer than 30 minutes

3. being older than 50 years old.

Knee discomfort on the majority of days during the previous month in addition to at least five of the following (clinical plus laboratory)

1. individuals with crepitus during active joint motion
2. individuals with morning stiffness lasting not more than 30 minutes
3. over 50 years of age [5].

In order to prevent the process of degeneration and avoid complications, osteoarthritis management involves educating the patient about the condition from which he or she is suffering, as well as improving function and managing pain. Education of the patient, weight loss, exercise, physical therapy, and knee braces are all examples of non-pharmacological treatments. Analgesics, intra-articular steroids, and intra-articular hyaluronan are all part of the medical therapy. Surgery is the patient's last resort for advanced situations.[6]

It is essential to develop medicines with low toxicity for OA patients with excellent efficacy without adverse effects. The homoeopathic medical system uses treatments that have been successfully used on humans while having no negative side effects on the patients.

This study focuses on using homoeopathy as an alternative treatment for knee osteoarthritis. Numerous studies have been done to demonstrate the efficacy of homoeopathic medications like Rhus tox, Bryonia alba, Calcarea carb, etc. in treating patients with osteoarthritis of the knee joint.

Examination of the knee joint:[7]

Knee Joint Examination - Pay attention to the patient's gait as soon as they walk into the room.

The knee should be extended at the heel strike and flexed at all other phases of the swing. In addition to noting any unusual swelling in or around the knee, keep an eye out for the absence of the natural hollows around the patella, which is a

symptom of swelling in the knee joint and suprapatellar pouch.

Ask the patient to stretch their knees and sit on the edge of the examination table for palpation.

The muscles, tendons, and ligaments are more relaxed and simpler to palpate in this position, which also makes bone landmarks more evident.

#### **Boenninghausen therapeutic pocket Book:**

Boenninghausen therapeutic pocket book. (1846)

Author: Dr. Timothy field Allen

Introduction: Dr. H.A. Roberts and Dr. Annie Wilson

Total pages:503

Part 1 : Preface, Life History of Boenninghausen ,Introduction

pertaining to one part should also be applied to other parts. Thus Boenninghausen raised the local symptoms (particulars)in to a general level, which could be used for the whole pers on.This principle is otherwise known "Doctrine of Grand Generalization".

#### **Philosophical background:**

Boenninghausen emphasized more on completing the symptoms with their components i.e Location, Sensation, Modality, Concomitant.

Fundamental concepts:

1. Doctrine of Analogy and Doctrine of Grand Generalization.
2. Doctrine of Concomitant.
3. Evaluation of Remedies:
  - 5marks-1st grade-CAPITAL
  - 4marks-2nd grade-Bold
  - 3Marks-3rd grade-Italics
  - 2marks- 4th grade-Romans
  - 1mark-5th grade-(roman parenthesis)
4. Concordances: Relationship of Remedies.

Advantages of BTPB:

1. It is based on complete symptoms Location, Sensation, Modalities, and Concomitant.
2. It more or less follows anatomical schema.
3. Doctrine of analogy
4. Five gradations are given in BTPB by Boenninghausen
5. Concomitants are given more importance
6. Modalities are given under a separate section.

#### **Introduction to Polarity Analysis:**

- In 2001 Dr. Heiner Frei developed "Polarity Analysis", a new approach to improve the precision of homoeopathic prescription.
- Dr . Heiner Frei MD is a Pediatrician in Laupen, Switzerland. He was born in 1950 in Brugg. He studied Medicine at the university of Berne, Switzerland and he was awarded an MD degree in 1977. He did his Specialization in pediatrics at the university hospitals of Bern and Lucerne, with special emphasis on paediatric surgery, neonatology, intensive care, oncology, and developmental medicine.
- Dr. Frei was the president of the Swiss Association of Homeopathic Physicians from the year 2001 to 2005.
- He has done many Research activities and publications which mainly focused on clinical studies about acute tonsillitis, otitis media, ADHD, H1N1 influenza, the treatment of multimorbid patients using Polarity analysis software and homeopathic methodology.
- Polarity analysis is a result of 30 years of research by Dr. Frei, its utility and importance was well understood by him during the study of Swiss ADHD double-blind trials.
- Based on Boenninghausen's therapeutic pocket book, polarity analysis is a new repertorization technique. Estimating the healing likelihood for each remedy-estimating the healing likelihood for each remedy, it enables homoeopaths to obtain exact, effective, homoeopathic prescriptions and raises the prescription success rate.

- When repertorizing a case using Polarity Analysis software, the main emphasis is on dependable symptoms, particularly modalities and polar symptoms. They are the most recognizable symptoms and aid in identifying each patient as an individual.
- In Polarity Analysis, the symptom reliability is determined in accordance with BTPB, 1846. High reliability, intermediate reliability, and low-reliability symptoms have all been classified.

High reliability: Polar symptoms and modalities.

Intermediate reliability: commonly physical findings and localization.

Low reliability: Symptoms that can be interpreted.

- Because the grade in Boenninghausen's therapeutic pocket book, on which Polarity analysis software is based, 5-Capital, 4-Bold face, 3-Italics, 2-Roman, and 1-(Roman parenthesis), and it includes components of a genius treatment as well.
- The symptoms of the patients (especially the modalities) should match with the genius of the remedies because the genius of the remedies includes those modalities, sensations, and findings that are frequently seen in the proving's of the remedy and which helped in clinically healing the various complaints of the patients. Boenninghausen also tried to match the patient's symptoms as closely as possible to the genius of the remedies.

#### **Polarity difference:**

The grades of a patient's polar symptoms measured against a remedy are added, and the grades of the opposite polar symptoms measured against the same remedy are subtracted, to determine the polarity difference. If there are no contraindications, the remedy will match the patient's typical symptoms better the higher the polarity difference.

When a patient's graded polar symptoms for a specific medicine are lower than the sum of their graded opposite polar symptoms for the same

remedy, that remedy is contraindicated. The cure is contraindicated even if the polarity difference is in negative numbers.

#### **Research Question:**

Polarity analysis software is an advantage to BTPB in selecting the precise homoeopathic similimum in the cases of osteoarthritis

#### **Research Hypothesis:**

NULL HYPOTHESIS: Polarity analysis software does not give precise homoeopathic similimum in the treatment of Osteoarthritis.

#### **Aim & Objectives:**

**Aim:** To study whether polarity analysis software gives precise similimum and helps in differentiation and final selection of remedy in cases of Osteoarthritis in comparison with Boenninghausen Therapeutic Pocket Book.

**Objectives:**

- 1.To repertorize the cases of Osteoarthritis using BTPB
- 2.To repertorize the cases of Osteoarthritis using Polarity analysis software.
- 3.To compare the results of cases repertorized by BTPB and Polarity analysis software

#### **MATERIAL AND METHODS**

**Study Setting:** The study will be carried out in Bharati Vidyapeeth Homoeopathic Medical Hospital OPD, IPD and various camps conducted by hospital.

**Selection of samples:** 30 cases, patients of both genders, fulfilling the criteria of inclusion and exclusion will be taken for the study. 15 cases will be repertorized using BTPB, 15 cases will be repertorized using polarity analysis software. Cases will be repertorized on the division of odd (BTPB) and even numbers (Polarity Analysis software)

**CTRI No: CTRI/2020/01/039088 [registered on:30/01/2022]**

Case Definition: All Cases presenting with c/o osteoarthritis assessed by WOMAC index which can be re-perforated by BTPB and polarity analysis software in age group of

30-70 years and both genders will be included in my study.

**Inclusion Criteria:**

1. Patients with complaints of osteoarthritis assessed by the WOMAC index will be included irrespective of their socioeconomic status and occupation.
2. Patients with pre-diagnosed osteoarthritis.
3. Both sexes male and female will be included.
4. Patients of 30-70 years of age group will be included.

**Exclusion criteria:**

1. Patients who require surgical intervention.
2. Patients with complaints of secondary osteoarthritis except obesity.
3. Patients who are not willing to give consent for the study.

**Study Design:**

The study will be conducted in Bharati Vidyapeeth homeopathic hospital OPD, IPD, and various camps conducted by hospital, minimum 30 cases that satisfy the case definition, inclusion and exclusion criteria will be studied with the help of guide ,senior homeopathic physicians .It is a Prospective Non-Randomized experimental single blind study .

Allocation: Non-Randomized

Masking: Single-blind

End point: To check the Effectiveness homoeopathic prescription in the cases of osteoarthritis and to Improve the quality of life of a person.

Whether Polarity analysis software is an advantage over BTPB in clinical prescribing of final similitum.

**Intervention:**

After careful case-taking, well-selected remedies will be administered through the oral route and will be administered as per the requirement of patients. medicine will be administered in the form of globule, powder, or liquid sublingually.

Duration of study:

The study will be carried out for a duration of 18 months.

Drugs will be acquired from the standard homeopathic pharmacy as per the rules of homoeopathic pharmacopeia. Medicine will be stored in Bharati Vidyapeeth homoeopathic pharmacy, katraj, pune\_411043

Statistical Techniques & Data Analysis:

As per the requirement of the study, the data is analysed, with t-test

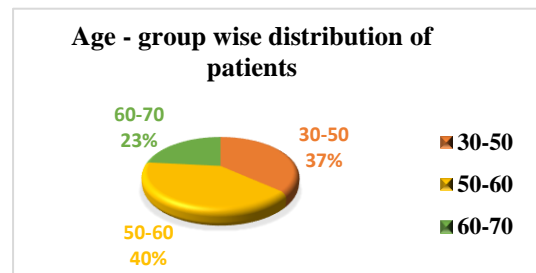
**Results:**

In this trial 32 patients were registered within the study 2 participants were ruled out as per inadequate follow-ups and they were excluded from the study. A total of 30 patients were registered in the trial within the age group of 30-70 years of both age groups. The history taking and examination of each case was done according to a standardized format designed for my dissertation. The selection of cases was based on inclusion and exclusion criteria. Selection of the remedy was done on the basis of the totality of symptoms with the help of the BTPB and Polarity Analysis software.

The subsequent tables and graphs are displayed below:

Table :1and Figure:1 Representing Age group wise distribution of Patients

Age Group	No of patients	Percentage
30-50	11	37%
50-60	12	40%
60-70	7	23%



The above table1 and Figure 1 show that 37% of the patients had an age between 30-50 years, 40% of the patients had an age between 50-60 years, and 23% had an age between 60-70 years in the study.

Table: 2 and Figure: 2 Showing gender wise distribution of patients:

Gender	No. of patients	Percentage
FEMALE	17	56.67%
MALE	13	43.33%

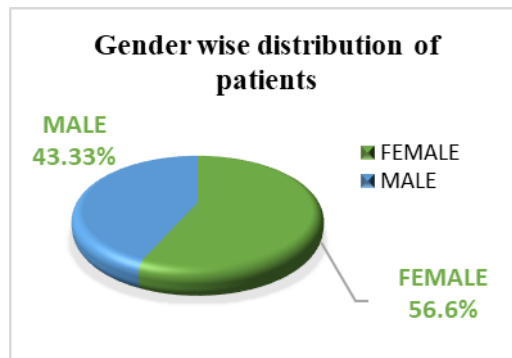


Table no.2 and Figure 2 show that 56.6% of patients were females and 43.33% were males in the study.

Table:3 and Figure: 3 Affected Knee-joint wise distribution of patients:

Knee Joint Affected	No.of Patients	Percentage
Both knee	18	60.00%
Left Knee	6	20.00%
Right Knee	6	20.00%

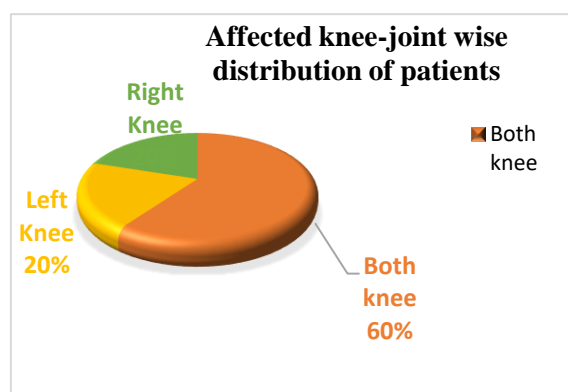


Table no.3 and Figure 3 show that 60% of patients had both their knees affected, 20% of patients had their left knee affected and 20% of patients had issues with the right knee.

**Table 4: Medicine-prescribed Distribution of patients**

<b>Medicines Prescribed</b>	<b>No.of Patients</b>	<b>Percentage</b>
Arsenic alb	1	3.33%
Belladonna	3	10.00%
Bellis per	1	3.33%
Bryonia	2	6.67%
Calc carb	2	6.67%
Causticum	2	6.67%
China Officinalis	2	6.67%
Kali Carb	3	10.00%
Lachesis	1	3.33%
Lycopodium	2	6.67%
Nat mur	1	3.33%
Natrum carb	1	3.33%
Psorinum	1	3.33%
Pulsatilla	1	3.33%
Rhustox	2	6.67%
Sulphur	3	10.00%
Thuja	2	6.67%

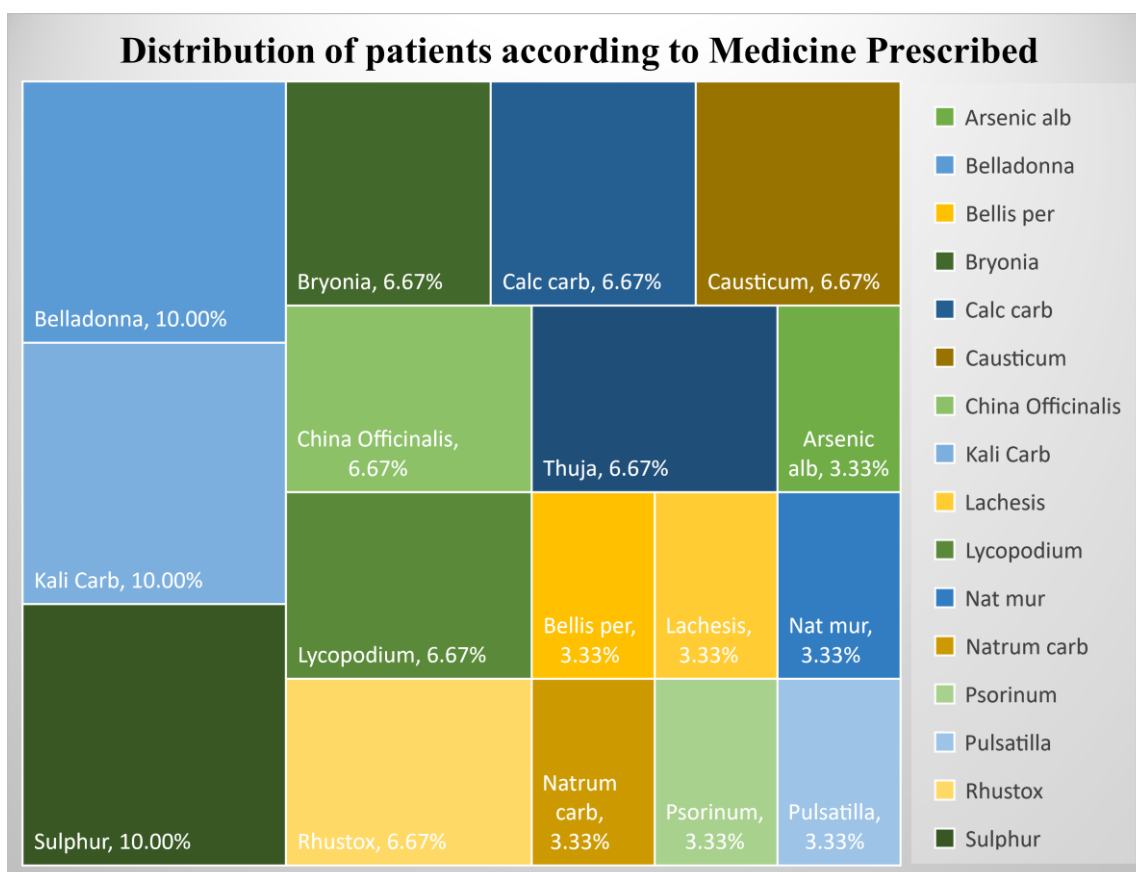


Table 4 and Fig.4 show the Distribution of patients according to the Medicine Prescribed for the treatment of knee osteoarthritis.

Belladonna, Sulphur, and Kali Carb each of this medicine were prescribed to 10% of patients under study.

Hypothesis Tested:

H<sub>0</sub>: Polarity analysis software is not an advantage over BTPB in clinical prescribing of final similimum. (Polarity analysis software does not give precise homeopathic similimum in the treatment of Osteoarthritis

Vs

H<sub>1</sub>: Polarity analysis software is an advantage over BTPB in clinical prescribing of final similimum.

**Table 5: Two sample t-test and Descriptive statistics of the WOMAC score difference (before and after the intervention) based on the Repertory used.**

Repertory	N	WOMAC Score Difference Mean± SD	T Statistic Value	P-Value
BTPB	15	28.67 ± 6.03	T-stat with 28 df. = -2.72	0.01*
Polarity Analysis	15	35.53± 7.71		
95% CI for the mean difference		(-12.04, -1.69)		

WOMAC Score Difference= WOMAC score before Homeopathic treatment - WOMAC score after Homeopathic treatment.

P Value <0.05, Considered to be statistically significant.

Hence there is a significant difference in the average of “WOMAC score difference” between BTPB and Polarity Analysis.

A test used: Two sample t-test, \*: Significant Difference, T Statistic-value: Test Statistic value, df: degrees of freedom. 95% CI for the mean difference: 95% Confidence Interval for the mean difference.

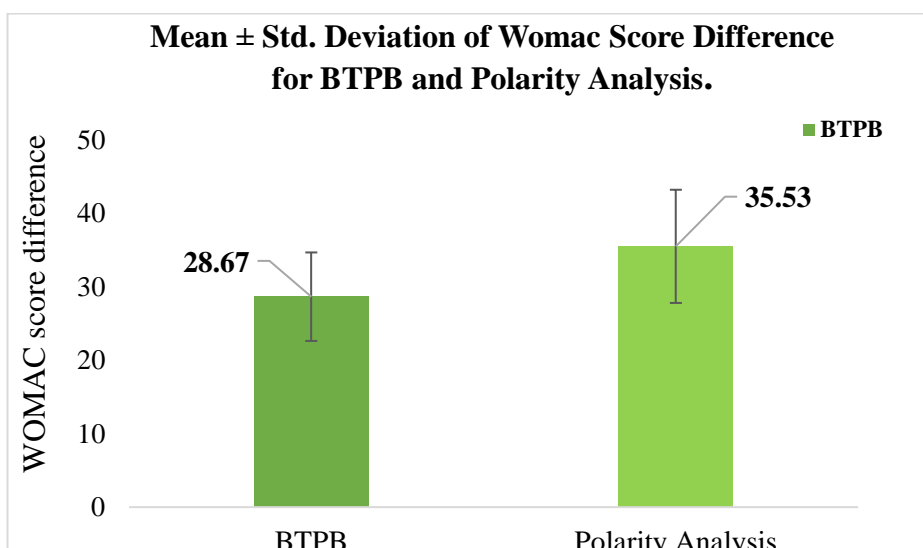


Table 5 and Fig 5 gave descriptive Statistics and two sample t-test of the WOMAC score difference for BTPB and Polarity Analysis.

WOMAC Score Difference= WOMAC score before Homeopathic treatment - WOMAC score after Homeopathic treatment of knee joint pain.

Here average “WOMAC Score Difference” is compared for both Repertory BTPB and Polarity Analysis.

When BTPB Repertory is used, the average “WOMAC score difference” is 28.67 + 6.03(mean± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “WOMAC score difference” is 35.53+ 7.71 (mean± sd) before and after the intervention of treatment for knee joint pain.

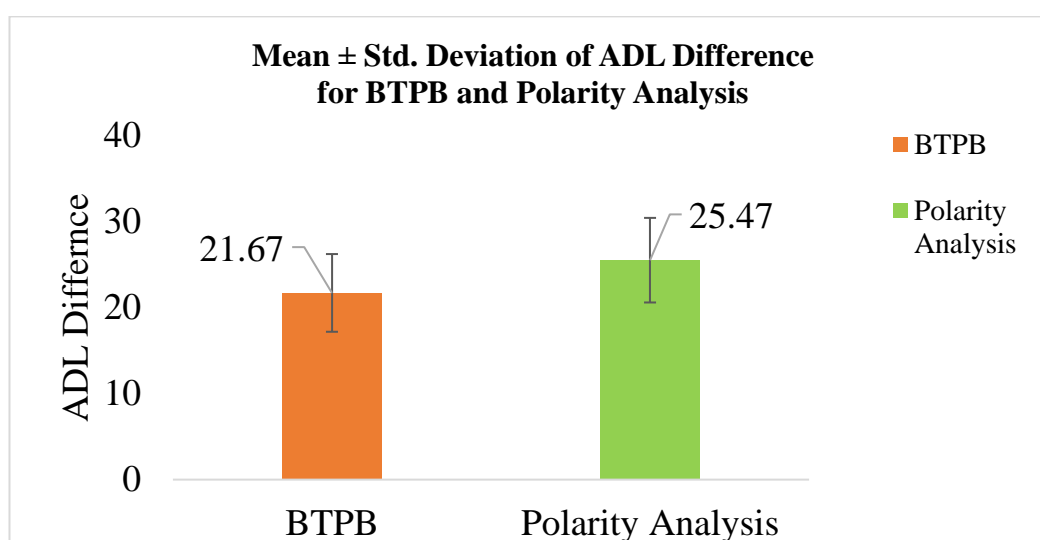
To test the hypothesis:The average “WOMAC score difference “, based on BTPB and Polarity analysis treatment is the same, a two-sample t-test is used.

The t-statistic value is -2.72 and the p-value of 0.01\* is significant.

We reject Ho and conclude that there is a significant difference in the average “WOMAC score difference”, based on BTPB and Polarity analysis treatment. In this study 15 Patients each were repertorized with both the repertories and found that a significant difference is seen in the improvement of the Womac scale before and after the intervention of homeopathic remedies, and polarity analysis is definitely helpful in prescribing similimum, as the sample size was small further studies are required with large sample size in future.

Table 6 and Fig 6: Representing the Mean  $\pm$  SD of “ADL Difference” for BTPB and Polarity Analysis.

Repertory	N	ADL difference Mean $\pm$ SD	T Statistic Value	P-Value
BTPB	15	21.67 $\pm$ 4.51	T-stat with 28 df.= -2.21	0.03*
Polarity Analysis	15	25.47 $\pm$ 4.91		
95% CI for the mean difference		(-7.33, -0.27)		



Bar diagram representing the Mean  $\pm$  SD of “ADL Difference” for BTPB and Polarity Analysis.

Table 6 and Fig 6 gave descriptive Statistics and two sample t-test of the “ADL Difference” for BTPB and Polarity Analysis.

“ADL Difference” = ADL before Homeopathic treatment - ADL after Homeopathic treatment of knee joint pain.

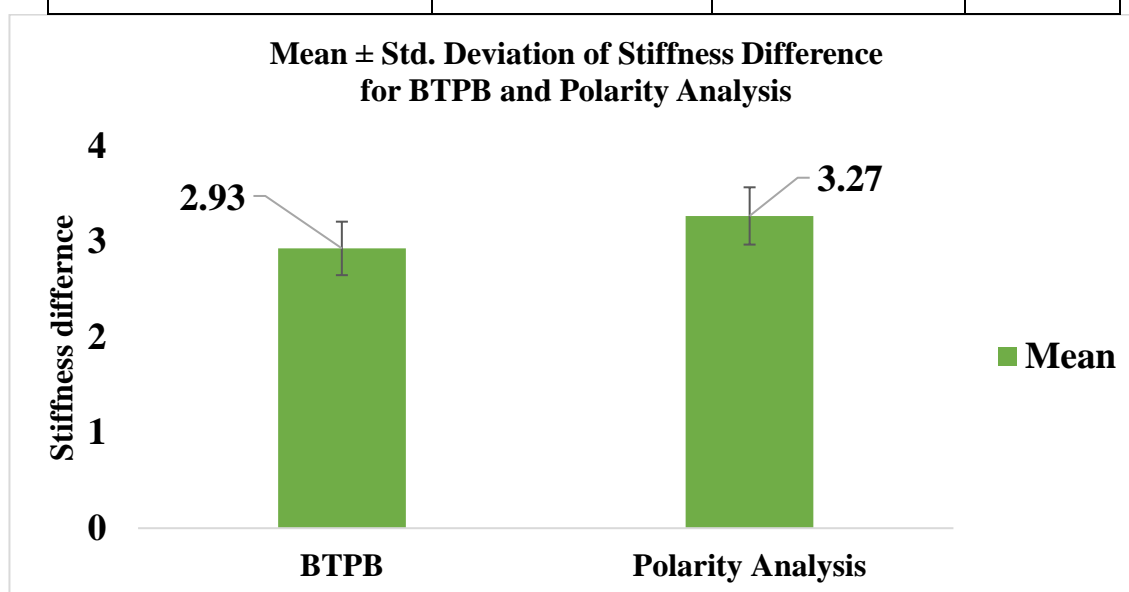
Here average “ADL Difference” is compared for both Repertory BTPB and Polarity Analysis.

When BTPB Repertory is used, the average “ADL Difference” is 21.67 $\pm$  4.51 (mean $\pm$  sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “ADL Difference” is 25.47 $\pm$  4.91 (mean $\pm$  sd) before and after the intervention of treatment for knee joint pain.

Table 7 and Fig 7 Descriptive Statistics and two sample t-test of the “Stiffness Difference” for BTPB and Polarity Analysis

Repertory	N	Stiffness score difference Mean±SD	T Statistic Value	P-Value
BTPB	15	2.93 ± 1.1	T-stat with 28 df= -0.81	0.427
Polarity Analysis	15	3.27± 1.16		
95% CI for the mean difference		(-1.18, 0.51)		



Stiffness score Difference=Stiffness before Homeopathic treatment - Stiffness after Homeopathic treatment.

P Value >0.05, Considered to be statistically not significant.

Hence there is no significant difference in the average “Stiffness score Difference” when BTPB and Polarity Analysis based treatments are used.

A test used: Two sample t-test, \*: Significant Difference, T Statistic-value: Test Statistic value, df: degrees of freedom. 95% CI for the mean difference: 95% Confidence Interval for the mean difference.

Table 7 and Fig 7 Descriptive Statistics and two sample t-test of the “Stiffness Difference” for BTPB and Polarity Analysis.

“Stiffness Difference” = Stiffness before Homeopathic treatment - Stiffness after Homeopathic treatment of knee joint pain.

Here average “Stiffness Difference” is compared for both Repertory BTPB and Polarity Analysis.

When BTPB Repertory is used, the average “Stiffness Difference” is 2.93 ± 1.1 (mean± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “Stiffness Difference” is 3.27± 1.16 (mean± sd) before and after the intervention of treatment for knee joint pain.

To test the hypothesis:

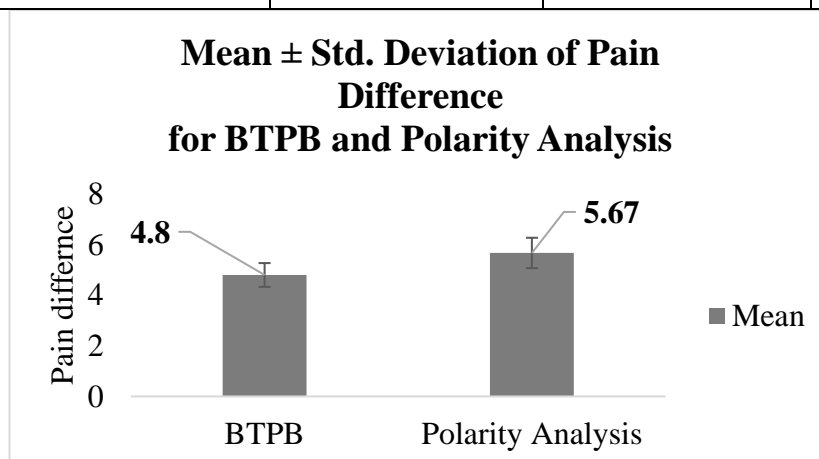
The average “Stiffness Difference”, based on BTPB and Polarity analysis treatment is the same, a two-sample t-test is used.

The t-statistic value is -0.81 and the p-value of 0.427 is significant.

We can not reject Ho and conclude that there is no significant difference in the average “Stiffness Difference”, based on BTPB and Polarity analysis treatment.

**Table 8 and Fig 8: Descriptive Statistics and two sample t-test of the “Pain Difference” for BTPB and Polarity Analysis**

Repertory	N	Pain difference Mean± SD	T Statistic Value	P-Value
BTPB	15	4.8 ± 1.82	T-stat with 28 df.= -1.14	0.265
Polarity Analysis	15	5.67± 2.32		
95% CI for the mean difference		(-2.42,0.69)		



T

able 8 and Fig 8 gave descriptive Statistics and two sample t-test of the “Pain Difference” for BTPB and Polarity Analysis.

“Pain Difference” = Pain before Homeopathic treatment - Pain after Homeopathic treatment of knee joint pain.

Here average “Pain Difference” is compared for both Repertory BTPB and Polarity Analysis.

When BTPB Repertory is used, the average “Pain Difference” is 4.8 ± 1.82 (mean± sd) before and

after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “Pain Difference” is 5.67± 2.32 (mean± sd) before and after the intervention of treatment for knee joint pain.

To test the hypothesis:

The average “Pain Difference”, based on BTPB and Polarity analysis treatment is the same, a two-sample t-test is used.

The t-statistic value is -1.14 and the p-value of 0.265 is significant.

We cannot reject  $H_0$  and conclude that there is no significant difference in the average "Pain Difference", based on BTPB and Polarity analysis treatment.

**Table 9 and Fig 9: Descriptive statistics and paired t-test of the WOMAC score before and after Homeopathic treatment.**

WOMAC score	N	Mean±SD	T- Statistical value	P- Value
WOMAC score before RX	30	64.4±9.30	23	0.000**
WOMAC Score after RX	30	32.3 ±7.74		
95% CI for the mean difference	(29.24, 34.95)			

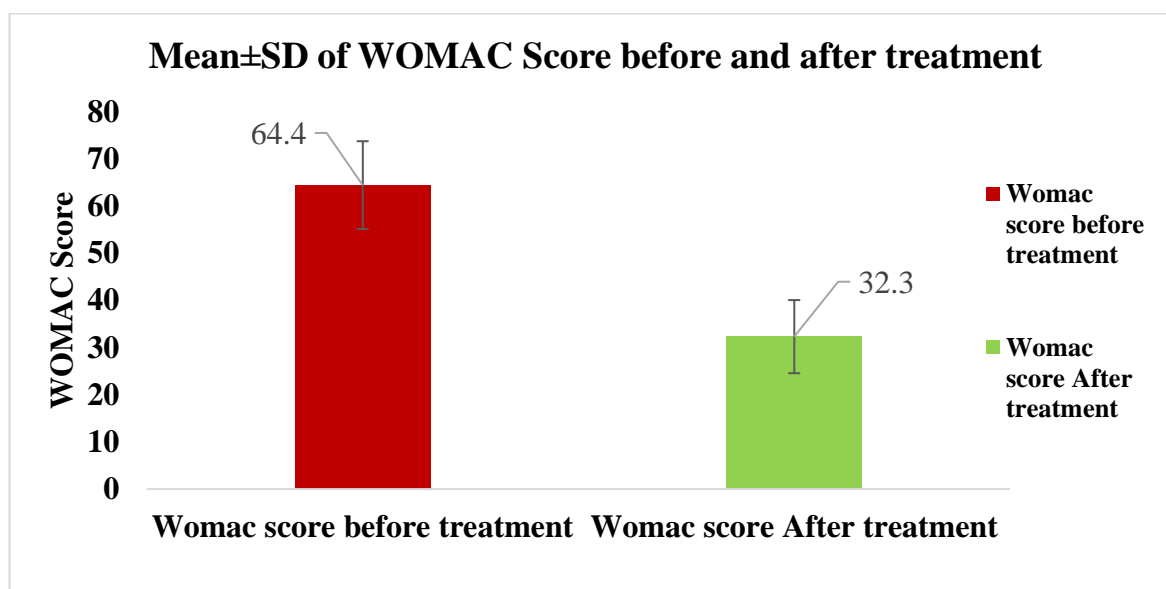


Table 9 and Fig 9 shows the descriptive Statistics and paired t-test of WOMAC score before and after the intervention of treatment for the knee.

Before treatment, the Mean WOMAC score was 64.4±9.30 ( mean± SD) which reduces to 32.3 ±7.74 after treatment.

To test the hypothesis of whether homeopathy medicines affect the treatment of knee osteoarthritis or not, the Paired t-test is used.

The t-statistic value is 23 with a p-value of 0.000 \*\* highly significant.

We reject  $H_0$  and conclude that homeopathy medicines affect the treatment of knee osteoarthritis.

**Table 10: Descriptive statistics of the WOMAC score difference, ADL difference, Stiffness difference, and Pain difference based on the Repertory used.**

Variables under study	Mean±SD	
	BTPB	Polarity Analysis
	N=15	N=15
WOMAC score difference	28.67 ± 6.03	35.53 ± 7.71
ADL difference	21.67 ± 4.51	25.47 ± 4.91
Stiffness score difference	2.93 ± 1.10	3.27 ± 1.16
Pain difference	4.80 ± 1.82	5.67 ± 2.32

Table 10 gives the Descriptive statistics of the WOMAC score difference, ADL difference, Stiffness difference, and Pain difference based on the Repertory used.

WOMAC Score Difference= WOMAC score before Homeopathic treatment - WOMAC score after Homeopathic treatment of knee joint pain.

When BTPB Repertory is used, the average “WOMAC score difference” is 28.67 ± 6.03 (mean ± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “WOMAC score difference” is 35.53 ± 7.71 (mean ± sd) before and after the intervention of treatment for knee joint pain.

“ADL Difference” = ADL before Homeopathic treatment - ADL after Homeopathic treatment of knee joint pain.

When BTPB Repertory is used, the average “ADL Difference” is 21.67 ± 4.51 (mean ± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “ADL Difference” is 25.47 ± 4.91 (mean ± sd) before and after the intervention of treatment for knee joint pain.

“Stiffness Difference” = Stiffness before Homeopathic treatment - Stiffness after Homeopathic treatment of knee joint pain.

When BTPB Repertory is used, the average “Stiffness Difference” is 2.93 ± 1.1 (mean ± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “Stiffness Difference” is 3.27 ± 1.16 (mean ± sd) before and after the intervention of treatment for knee joint pain.

“Pain Difference” = Pain before Homeopathic treatment - Pain after Homeopathic treatment of knee joint pain.

When BTPB Repertory is used, the average “Pain Difference” is 4.8 ± 1.82 (mean ± sd) before and after the intervention of treatment for knee joint pain.

When Polarity Analysis is used, the average “Pain Difference” is 5.67 ± 2.32 (mean ± sd) before and after the intervention of treatment for knee joint pain.

**Discussion:**

A two-sample t test used shows Descriptive statistics of the WOMAC score difference, ADL difference, Stiffness difference, and Pain difference based on the Repertory used. With this we can see that as earlier studies suggested individualised medicine on totality obtained after repertorization proved to be effective in the treatment of osteoarthritis. This study is an attempt to understand whether Polarity Analysis Software is

an advantage over BTPB in Patients suffering from osteoarthritis using WOMAC scale.

The Results Indicate that medicine administered based on Polarity Analysis is better than BTPB, As the Polarity Analysis Software is mainly based the contraindications given by Boenninghausen.

#### **Conclusion:**

The medicines, which were selected and prescribed on the basis of chief complaint, after the repertorization from BTPB and Polarity Analysis software, showed significant results in the treatment of osteoarthritis. Homeopathic medicines are effective in the treatment of osteoarthritis. The results are supportive to open new paths for future studies on Osteoarthritis and homeopathic treatment. As the sample size was small further studies with larger sample sizes are needed.

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#### **Conflict Of Interest:**

“The authors have no conflicts of interest to declare.”

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