

AN OBSERVATIONAL STUDY OF SWA-ANJALI PRAMANA IN HEALTHY INDIVIDUALS TO DETERMINE THE RANGE OF ANTHROPOMETRIC MEASUREMENT – PILOT STUDY

Dr. Meghna V. Nikam¹, Dr. Suvarna P. Shelar², Dr. Bharat M. Rokade³, Dr. Soniya P. Takawale⁴, Vd. Seema D. Joshi⁵

1. PG scholar, Department of Rachana Sharir, College of Ayurved, Bharati Vidyapeeth Deemed to be University, Pune, Maharashtra, India

2. Associate Professor, Department of Rachana Sharir, College of Ayurved, Bharati Vidyapeeth Deemed to be University, Pune, Maharashtra, India

3. Associate Professor, Department of Shalya Tantra, College of Ayurved, Bharati Vidyapeeth Deemed to be University, Pune, Maharashtra, India

4. Associate Professor, Department of Rachana Sharir, MACH & RC, Ahilyanagar, Maharashtra, India

5. Associate Professor, Department of Rachana Sharir Mahesh Ayurved College and Hospital, Ashti. Taluka- Ashti, District - Beed, Maharashtra, India

Corresponding Author- Dr. Suvarna P. Shelar. Associate Professor, Department of Rachana Sharir, College of Ayurved, Bharati Vidyapeeth Deemed to be University, Pune, Maharashtra, India

Email id- spshelar03@gmail.com

Abstract

This study analyzes gender-based differences in various anthropometric measurements, including length, width, Swa Anjali dimensions, and related parameters. Data from 5 boys and 5 girls were compared using t-tests to assess statistical significance. The results indicate that boys consistently exhibit larger measurements across most parameters. Significant differences ($p < 0.05$) were observed in length, width, Swa Anjali measurements, and length from the middle finger to the radio-ulnar notch, with boys showing higher values. However, a few Swa Anjali parameters did not show statistical significance, suggesting minimal gender-based variation in specific aspects. The findings emphasize anatomical differences between boys and girls, which could have implications in anthropometry, clinical research, and Ayurveda. These results support the need for gender-specific considerations in Pramana studies. Future research with a larger sample size is recommended to validate these findings and explore their relevance in medical and Ayurvedic applications.

Key Words: Anjali Pramana, Anguli Pramana, Anthropometry, Swa-Anjali.

INTRODUCTION

According Acharya Sushruta Samhita to understand, anatomy grossly human body is divided into major six components. So, body is divided into two upper and two lower extremities, Trunk, Thorax, Abdomen, Head, Neck & face.¹ In the era of Sushruta, Charaka the body proportion were assumed on Anguli Pramana, means measuring various body parts were by applying self Anguli. Anguli is one the oldest unit of measurement appears to be more natural and scientific method. Ayurveda has given importance to individualistic approach rather than a generalized one.² Pramana Sharir and the Scientific Relevance of Anguli Pramana, Pramana Sharir, as described in Ayurveda, serves as a scientific framework for assessing an individual's physical dimensions and physiological attributes. Among its tools, **Anguli**

Pramana is a unique measurement system based on the width of an individual's own finger (*Swa Angula*), emphasizing the concept of individuality. This ancient approach aligns with the personalized medicine of today, offering insights into diagnostic and therapeutic practices. Anguli Pramana is extensively mentioned in Ayurvedic classics, where it is used to evaluate body proportions, diagnose imbalances, and guide treatment strategies. Sushruta outlines specific measurements, such as the hand span (*Hastatala*), which is 6 Anguli in length and 4 Anguli in width. These parameters also reflect overall health, lifespan, and quality of life. The study of Anguli Pramana is particularly relevant for individuals in the

Samatvagatviryau age group (25 years for males, 16 years for females), representing the peak of physical and functional maturity. By standardizing these ancient methodologies, researchers can integrate this knowledge into modern science, highlighting its potential in precision diagnostics and personalized healthcare. Thus, Anguli Pramana exemplifies the timeless relevance of Ayurveda in understanding human anatomy, promoting health, and addressing disease through individualized approaches. The Aayaam (Vertical height) of the any individual's whole body should be 84 Angula and Aayaam should be equal to Vistaar (Arm span or horizontal height) of the body. The person having Aayaam (vertical height) and Vistaar (Arm span) equal to each other is known as Sama Purusha (Anatomically proportionate healthy person) and these Person will have Uttam Ayu (longevity), Bala Oja, Sukha, Aishvarya, Vita (wealth).⁵

Material Methodology

A total of 10 healthy individuals (5 males and 5 females) aged between 23 and 30 years were selected for this study. Participants with any congenital or acquired deformities of the hand were excluded. Informed Consent of participant was taken prior to enroll. The study was conducted at Bharati Vidyapeeth Deemed to be University, College of Ayurved. Anthropometric measurements, including the length and width of *Hastatal* (palm region) for both hands, were recorded in centimetres. The dimensions of *Swa Anjali* were assessed using a Vernier caliper by measuring the span from the distal point of the left hand to the distal point of the right hand's metacarpals. Additional measurements included the width from the left index finger to the right index finger and from the left radioulnar notch to the right radioulnar notch. The *Swa Angula Pramana* (proximal interphalangeal joint measurement) of the right hand was also recorded.

To assess the volumetric capacity of *Anjali*, participants formed a cup-like shape (*Anjali Mudra*) using both hands. Water was poured into this space, and the volume was measured in milliliters using a measuring flask. This process was repeated with two different hand positions—keeping the thumb below and above the proximal interphalangeal joint. All measurements were systematically recorded for further analysis.

Observations of Study Data

Table Shows Data of Measurements of Right Hand

Variable	Group	N	Mean	SD	SE	t-Value	P-Value	Result
length	Girls	5	10.46	0.76	0.34	-2.514	0.036	Sig
	Boys	5	11.46	0.46	0.20			
Width	Girls	5	8.62	0.65	0.29	-2.382	0.042	Sig
	Boys	5	9.22	0.54	0.24			
length from highest point of middle finger upto radio Ulnar Notch	Girls	5	18.08	1.06	0.47	-2.610	0.031	Sig
	Boys	5	19.68	0.87	0.39			
length of swa anjalai	Girls	5	14.10	1.19	0.53	-2.691	0.027	Sig
	Boys	5	16.60	1.70	0.76			

The provided data compares different anthropometric measurements between **girls and boys**. The **mean values**, **standard deviation (SD)**, and **standard error (SE)** are given for both groups, along with the **t-value** and **p-value** to determine statistical significance.

1. **Length:**
 - The mean length for **girls** (10.46 cm) is significantly lower than that of **boys** (11.46 cm).
 - The **p-value** (0.036) < 0.05, indicating a **statistically significant** difference.
2. **Width:**
 - **Girls** have a mean width of 8.62 cm, whereas **boys** have 9.22 cm.
 - The **p-value** (0.042) < 0.05, suggesting a **significant difference** between the groups.
3. **Length from the highest point of the middle finger to the radio-ulnar notch:**
 - **Girls:** 18.08 cm, **Boys:** 19.68 cm.
 - **p-value** (0.031) confirms a **significant difference**.
4. **Length of Swa Anjali:**
 - **Girls:** 14.10 cm, **Boys:** 16.60 cm.
 - **p-value** (0.027) < 0.05, indicating **statistical significance**.

All the measured parameters show **significant differences** between boys and girls, with boys having **higher mean values** in all categories. This suggests a **consistent pattern** of larger dimensions in boys compared to girls in the study.

Comparison of Anthropometric Measurements Between Girls and Boys

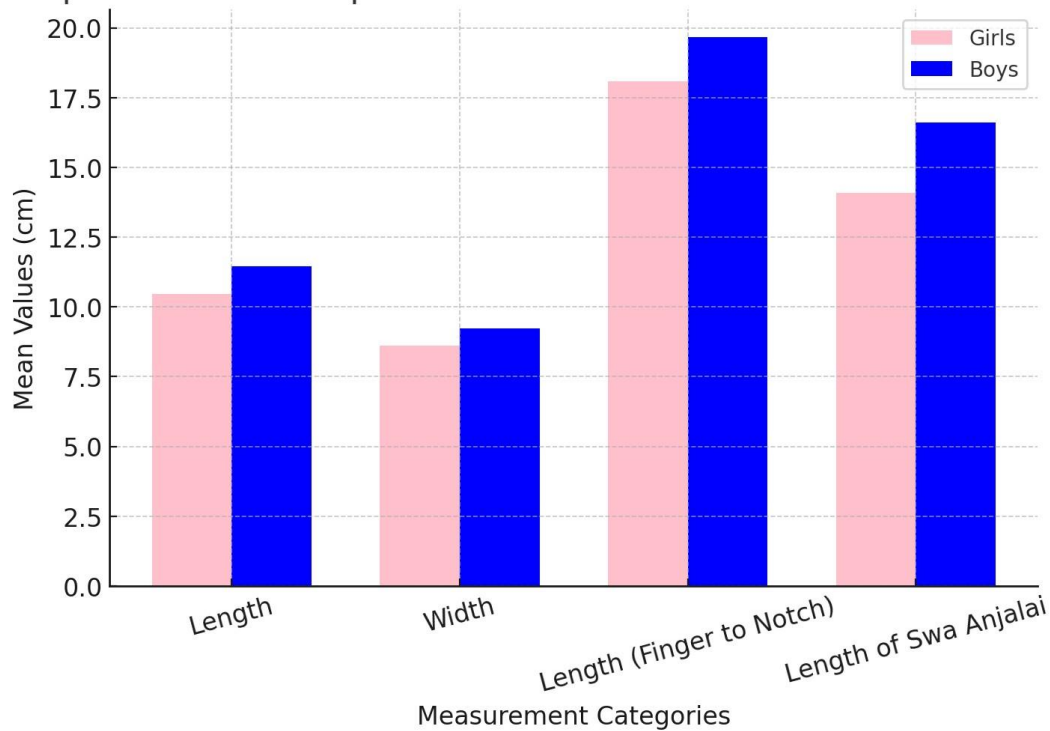


Table Shows Data of Measurements of Left Hand

Variable	Group	N	Mean	SD	SE	t-Value	P-Value	Result
length	Girls	5	10.52	0.57	0.26	-3.997	0.004	Sig
	Boys	5	11.82	0.45	0.20			
Width	Girls	5	8.40	0.65	0.29	-2.707	0.027	Sig
	Boys	5	9.34	0.42	0.19			
	Girls	5	18.00	0.87	0.39	-3.841	0.005	Sig

length from highest point of middle finger upto radio Ulner Notch	Boys	5	20.06	0.83	0.37			
length of swa anjalai	Girls	5	14.16	1.19	0.53	-2.208	0.058	NS
	Boys	5	16.44	1.98	0.89			

This study evaluates gender-based differences in four anthropometric parameters: **length, width, length from the middle finger to the radio-ulnar notch, and Swa Anjali length**. The results reveal that boys have significantly greater values for **length** ($p = 0.004$), **width** ($p = 0.027$), and **length from the middle finger to the radio-ulnar notch** ($p = 0.005$) compared to girls. However, **Swa Anjali length does not show a statistically significant difference** ($p = 0.058$), suggesting that this parameter remains relatively comparable between genders. The findings indicate notable anatomical variations between boys and girls, with boys exhibiting larger dimensions in most measured parameters. The statistically significant results ($p < 0.05$) reinforce the importance of gender considerations. Further research with larger sample sizes may provide deeper insights into these variations and their implications in medical and anatomical applications.

Graph Shows Data of Measurements of Left Hand

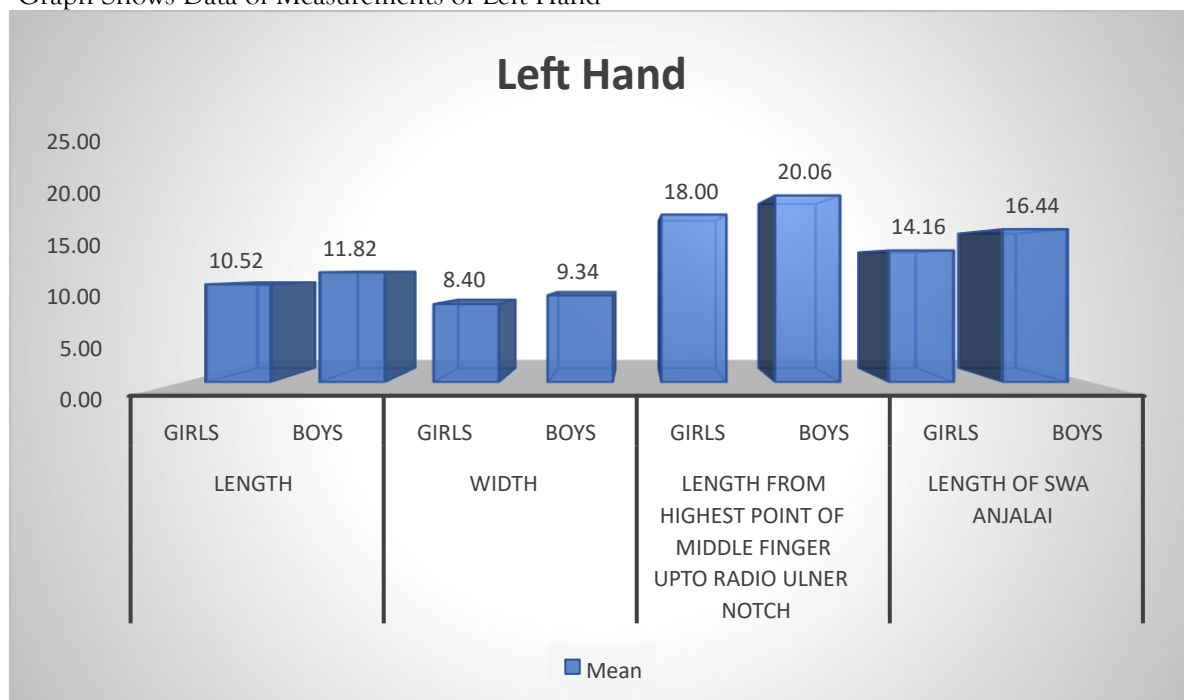


Table Shows Data of Measurements of Swa Anguli

Variable	Group	N	Mean	SD	SE	t-Value	P-Value	Result
measurement	Girls	5	1.46	0.05	0.02	-3.600	0.007	Sig

of width of swanjali	Boys	5	1.82	0.22	0.10			
----------------------	------	---	------	------	------	--	--	--

This study examines the **measurement of the width of Swa Anguli** between boys and girls. The results indicate that boys have a significantly greater mean width (**1.82 cm**) compared to girls (**1.46 cm**), with a **p-value of 0.007**, confirming a statistically significant difference (**p < 0.05**). The **t-value (-3.600)** further supports this distinction. These findings suggest that boys generally exhibit a wider Swa Anguli compared to girls, which may be attributed to anatomical variations. The statistically significant result underscores the importance of considering gender-based differences in anthropometric studies. Further research with larger sample sizes is recommended to validate these observations and explore their implications in clinical, anatomical, and Ayurvedic contexts. Thus, Every individual has his own Swa Anguli Pramana.

Graph Shows Data of Measurements of Anjali

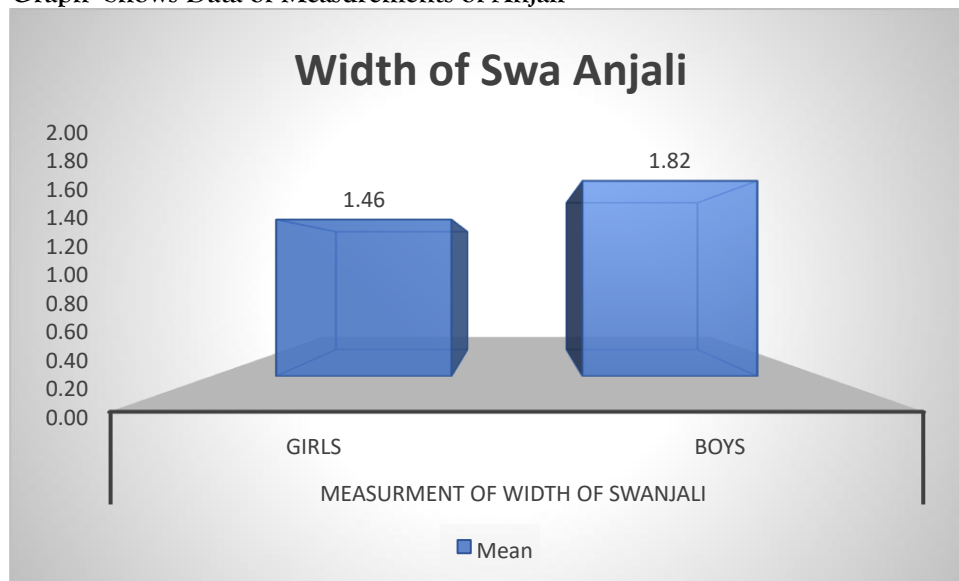


Table Shows Data of Measurements of Anjali

Variable	Group	N	Mean	SD	SE	t-Value	P-Value	Result
Width from distal points of 2nd metacarpal of let hand up to the 2 nd metacarpal of right hand.	Girls	5	13.74	1.34	0.60	-2.075	0.072	NS
	Boys	5	15.28	0.98	0.44			
Width of Anjali from tip of left-hand thumb to tip of right-hand thumb.	Girls	5	11.62	0.82	0.37	-3.854	0.005	Sig
	Boys	5	14.12	1.19	0.53			
Width of Anjali from tip of left-hand index finger to tip of right-hand index finger.	Girls	5	6.60	0.77	0.35	-1.742	0.120	NS
	Boys	5	7.56	0.96	0.43			
From tip of left thumb to tip of right thumb by keeping thumb below the proximal interphalangeal joint of index finger.	Girls	5	11.20	0.35	0.15	-3.071	0.015	Sig
	Boys	5	13.34	1.52	0.68			
	Girls	5	9.68	0.50	0.22	-3.041	0.016	Sig

From tip of left thumb to tip of right thumb by keeping thumb above the proximal interphalangeal joint of index finger.	Boys	5	11.74	1.43	0.64			
Width of Swa Anjali from the radial & ulnar notches	Girls	5	9.72	0.66	0.29	-5.642	0.000	Sig
	Boys	5	12.16	0.71	0.32			

This study examines gender-based differences in various **Anjali width measurements** in boys and girls. The findings reveal that boys generally exhibit larger widths across most parameters.

Significant Differences ($p < 0.05$):

Width of Anjali (thumb to thumb) → Girls: 11.62 cm, Boys: 14.12 cm ($p = 0.005$)

Thumb-to-thumb width (below index finger joint) → Girls: 11.20 cm, Boys: 13.34 cm ($p = 0.015$)

Thumb-to-thumb width (above index finger joint) → Girls: 9.68 cm, Boys: 11.74 cm ($p = 0.016$)

Width of Swa Anjali (radial & ulnar notches) → Girls: 9.72 cm, Boys: 12.16 cm ($p < 0.001$)

Non-Significant Differences ($p > 0.05$)

Width from distal 2nd metacarpal (left to right hand) → $p = 0.072$.

Index finger width (left to right hand) → $p = 0.120$.

These results suggest that boys have **statistically larger Anjali widths** in most cases, emphasizing **anatomical differences** between genders. Further research with larger sample sizes is recommended.

The results suggest that **boys generally have larger Swa Anjali dimensions than girls**, with statistically significant differences in most cases. The **two non-significant results** indicate that in some specific aspects, Swa Anjali measurements may not differ notably between genders. These findings highlight anatomical variations and emphasize the importance of gender considerations in anthropometric research. Further studies with larger sample sizes are recommended for validation.

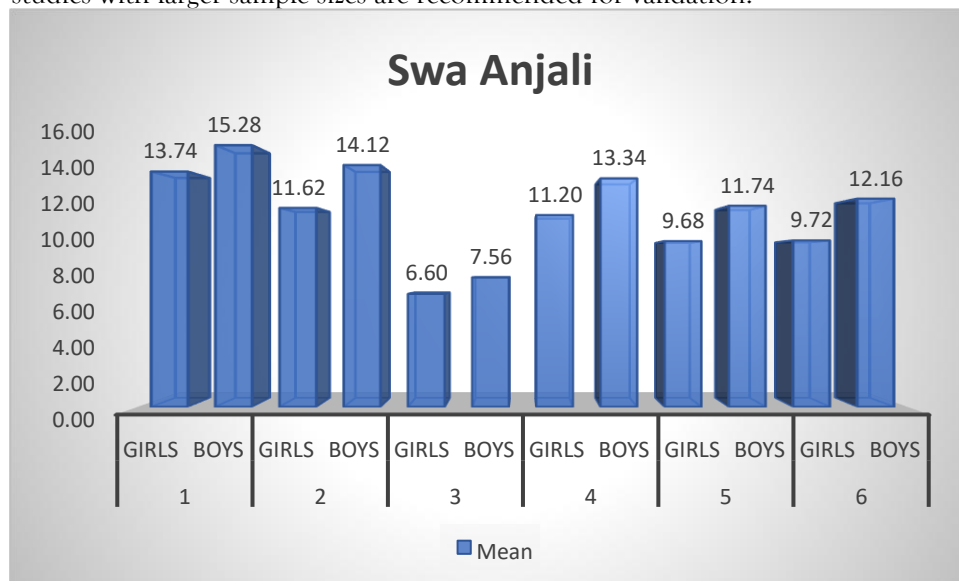


Table Shows Data of Measurements of Anjali Pramana

Variable	Group	N	Mean	SD	SE	t-Value	P-Value	Result
Volume of Swa Anjali by keeping thumb above the proximal	Girls	5	133.00	5.70	2.55	-4.320	0.003	Sig
	Boys	5	147.00	4.47	2.00			

interphalangeal joint								
Volume of Swa Anjali by keeping thumb below the proximal interphalangeal joint.	Girls	5	146.00	5.48	2.45	-4.131	0.003	Sig
	Boys	5	162.00	6.71	3.00			

This study evaluates **Swa Anjali measurements** between boys and girls. The results indicate that boys have significantly higher mean values compared to girls:

First Swa Anjali measurement:

Girls: 133.00 ± 5.70 cm

Boys: 147.00 ± 4.47 cm

t = -4.320, p = 0.003 (Significant)

Second Swa Anjali measurement:

Girls: 146.00 ± 5.48 cm

Boys: 162.00 ± 6.71 cm

t = -4.131, p = 0.003 (Significant)

Both results indicate a **statistically significant difference (p < 0.05)**, suggesting that boys have consistently larger Swa Anjali values than girls.

DISCUSSION

Unpaired t-test used for statistical analysis. Boys generally have larger Swa Anjali dimensions than girls. Swa Anjali is used to measure the liquids, so in present study we have not only measured the dimensions, but also we have measured the Volume of the swa anjali. And we concluded that, boys have larger Volume compared to girls. And also, the volume calculated by keeping the thumb below the interphalangeal joint is more than the thumb above the interphalangeal joint because when the thumb is above the interphalangeal joint the water discharges from the gap so it is concluded that the Swa-anjali formed by keeping the thumb below the interphalangeal joint is more appropriate.

The analysis of various anthropometric measurements, including **length, width, Swa Anjali dimensions, and related parameters**, reveals **significant gender-based differences** in most cases. Boys consistently exhibit **larger dimensions** than girls, with **statistically significant differences (p < 0.05)** observed in **length, width, Swa Anjali measurements, and interphalangeal thumb distances**. However, a few parameters, such as **the width from the distal 2nd metacarpal and index finger width**, did not show significant variation, indicating some similarities between genders.

These findings suggest that **boys generally have larger hand and Anjali dimensions compared to girls**, which may be attributed to **anatomical and physiological differences**. The present study highlights the **importance of gender considerations in anthropometry, clinical studies, and Ayurveda**, particularly in practices that involve hand-based measurements for diagnosis and therapy. Further research with a **larger sample size** will be done to validate these findings and explore their implications in **medical and Ayurvedic applications**.

CONCLUSION

1. Anthropometric measurement of Swa Anjali Praman can be determined.
2. Boys generally have large Volume capacity of Swa Anjali compared to girls.

3. Boys generally have larger hand and Anjali dimensions compared to girls, which may be attributed to anatomical and physiological differences.
4. The present study highlights the importance of gender considerations in anthropometry, clinical studies, and Ayurveda.

REFERENCES

1. Kaviraj Dr. Ambikadatta shashri. Sushruta Samhita, with Hindi translation of text. Purvardha, Sharira Sthan, 5/3 Reprint-2008. Varanasi: Chaukhamba Sanskrit Sansthan, p.64.
2. Sushruta. Kaviraj ambikadatta shastri, editor. Sushruta Samhita of Maharshi Sushruta with ayurved tatava sandipika kasha sanskrita grantaha mala. Chapter 35, verse- 12. Series 156 reprint 2007 page no 130.
3. Dr. Baidyanath Mishra. Concept of Anguli Pramana Sharira and Importance in Ayurveda. International Journal for Innovative Research in Multidisciplinary Field. 3(7);2017.p.279-281.
4. Dhannajay, Naresh K. Kumawat. Significance of Anguli Pramana In Ayurveda. A Critical review. IAMJ: Volume 3; Issue 3; March- 2015.p.947-950.
5. Sushruta. Kaviraj Ambikadatta Shastri, editor. Sushruta Samhita of Maharshi Sushruta with Ayurved Tatava Sandipika, Chapter 35/3, Kashi Sanskrita Grantaha Mala. Series 156 reprint 2007 page no 130.