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Standardization Of Aaturahasta Prasrita Pramana Of Vasti- An Observational Study

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Abstract
Background: *In Ayurveda, accurate dosage (Matra) plays a vital role in the effectiveness and safety of Panchakarma therapies. Aaturahasta Prasrita Pramana is the classical standard for determining the dose of Vasti Dravya (enema fluid). However, its practical standardization for different age groups has not been systematically validated in contemporary clinical settings.* ***Objectives:*** *To observe, measure, and standardize the Aaturahasta Prasrita Pramana for Vasti in different age groups using actual patient's hand measurements to ensure accurate dosing in clinical practice.* ***Methods:*** *A cross-sectional observational study was conducted on* ***900 voluntary participants****, divided into three age groups: Group A (6–7 years), Group B (12–13 years), and Group C (18 years and above), with 300 participants in each group. Participants were asked to hollow their palm to hold liquid (Aaturahasta), and the volume was measured using Madhutailika Vasti fluid. Mean, standard deviation (SD), and standard error of mean (SE) were calculated for each group. ANOVA and Tukey's post-hoc tests were applied to compare groups. Pearson correlation tested the relationship between age and measured volumes.* ***Results:*** *The mean Prasrita values were: Group A:* ***9.67****(in ml)* ***± 0.77 ml****, SE: 0.04 Group B:* ***20.31****(in ml)* ***± 1.16 ml****, SE: 0.06 Group C:* ***31.93****(in ml)* ***± 3.55 ml****, SE: 0.20. ANOVA showed a statistically significant difference ($p < 0.0001$) between all groups. The correlation among groups was negligible, supporting distinct age-wise dosage standards.* ***Conclusion:*** *The study validates the relevance of Aaturahasta Prasrita Pramana and provides age-specific standardization for clinical use of Vasti in Panchakarma. This practical measure aligns classical references with contemporary practice, ensuring safe and effective personalized dosing.*
Keywords: *Prasrita Pramana, Aaturahasta, Vasti, Panchakarma, Dosage Standardization, Observational Study*

INTRODUCTION

Panchakarma therapy is one of the most significant branches of Ayurveda, known for its unique bio-cleansing and therapeutic procedures. Among its five principal treatments, Vasti (medicated enema) holds the highest rank in the management of Vata disorders and numerous systemic diseases. The therapeutic success of Vasti largely depends on precise dosage (Matra) of the fluid administered. A correct dose ensures desired results and prevents untoward reactions such as incomplete evacuation or irritation of the colon.

The ancient Acharyas laid down practical measurement standards to maintain uniformity in dosage across different procedures. Prasrita Pramana is one such classical measure specifically described for calculating the quantity of Vasti Dravya. The term Prasrita is derived from the root "Pra+sru" and indicates the volume that can be held in the hollowed palm of an individual's outstretched hand. Acharya Sushruta distinctly emphasizes Aaturahasta Pramana (the patient's own hand measure) as the ideal standard for determining the amount of fluid to be administered during Niruha Vasti. This method respects individual variation in body constitution, age, and strength.

However, despite its textual authority, the Prasrita Pramana has not been objectively quantified in modern times. Classical sources mention that one Prasrita may approximately equal two Pala (about 96 ml), but this figure assumes the patient to be of average build (Madhyama Purusha). Practical differences arise due

to individual hand size, age, gender, and nutritional status. Consequently, standardization of Aaturahasta Prasrita Pramana is essential to bridge this gap between theoretical norms and practical application, especially in pediatric, adolescent, and adult patients where anatomical proportions vary significantly.
This observational study aims to validate and standardize the Aaturahasta Prasrita Pramana for Vasti administration by directly measuring the hollowed palm volume in a large sample of different age groups. By doing so, it seeks to preserve classical principles while aligning them with contemporary clinical practice, ensuring that Vasti remains a precise, safe, and individually tailored therapeutic tool in modern Panchakarma practice.

Aim and objectives

Aim

To standardize Aaturahasta Prasrita Pramana for Vasti in different age groups through direct measurement.

Objectives

1. To measure the volume of Prasrita (Aaturahasta) in children, adolescents, and adults.
2. To calculate the average Prasrita Pramana for each age group.
3. To validate classical references with practical data.
4. To provide age-wise dosage guidelines for safe Vasti administration.

MATERIAL AND METHOD

Study Design: An observational, cross-sectional study.

Study Setting: Participants were selected from various schools, colleges, private clinics, and government hospital OPDs to ensure representation of different age groups.

Sample Size:A total of 900 voluntary participants were selected, divided into three groups:

- Group A: Age 6–7 years (n = 300)
- Group B: Age 12–13 years (n = 300)
- Group C: Age 18 years & above (n = 300)

A study is conducted to calculate the vasti pramana of different age groups as per classically mentioned aaturhastasammiten. Three Different age groups is designed with particular age limits and 300 participants were selected in each group voluntary, irrespective of height, weight, sex and dimension of hands and fingers. Participants were asked to keep the palm of one hand stretched out and hollowed as it to hold liquid. The mixture of Madhutailika vasti poured into it and measurement of handful of mixture was taken. Measurements of 300 participants in each group were taken and average dose is calculated in each group. The final calculated dose was considered as Standardized Aaturahasta pramana.

TABLE NO. 1 METHODOLOGY

	Group A	**Group B**	**Group C**
Age	6-7	12-13	18 and above
Sample size	300	300	300
Source Of Data	Various schools and private and Govt. Hospital Setting	Various schools and private and Govt. Hospital Setting	Various colleges institute and private and Govt. Hospital Setting
Selection technique	Volunteer Participation	Volunteer Participation	Volunteer Participation

Selection criteria:

- **Inclusion:** Healthy individuals willing to participate voluntarily, irrespective of sex, height, weight, or hand dimensions.
- **Exclusion:** Individuals with any deformity of hand, injury or local pathology affecting palm measurement.

Method of data collection:

- Each participant was asked to extend one palm and hollow it naturally as if to hold liquid.
- A standard mixture (e.g. Madhutailika Vasti fluid) was poured into the hollowed palm.
- The entire volume was carefully measured using a graduated measuring jar.

- For accuracy, the measurement was repeated **three times** per participant and the average was recorded.

Data recording:

The measured Prasrita volume of each participant was documented. Mean, standard deviation (SD), and standard error of mean (SE) were calculated for each group.

Statistical analysis:

Data were analyzed using:

- **ANOVA** to test significance between groups.
- **Tukey's multiple comparison test** for pairwise comparisons.
- **Pearson correlation coefficient** to check relation between age and Prasrita value.

Outcome:

Standardized average Aaturahasta Prasrita Pramana values were derived for each age group, to guide practical dosing of Vasti Dravya in Panchakarma.

Conceptual Study

In Panchakarma procedures dose is an important factor to attain optimum efficacy of the therapy. Change in dose can vary the result and it can lead to side effects or no expected effect. Ayurveda have its own standards for measurements such as Bindu pramana for drava dravya used in Nasya[1], Anguli pramana for measurements of body parts[2], Anjali pramana for measuring the quantity of body fluids[3] etc. Likewise Prasrita pramana is mentioned for the measurements of drava dravya used in vasti[4].

The word Prasrita is derived from the root word "pra+sru" by adding "kath" pratyaya and it is a pulinga word[5]. There is different meaning of Prasrita which is given as kunchitaanguli pani[6], pala dvyam[7], nikunhca pani[5], ardha anjali[5] etc. Prasrita and prasriti both are synonyms[7]. The word meaning of Prasrita is hollowed palm of outstretched hand, as to hold liquid or the quantity that would be contained in the hollow of the palms of the patient's hand extending to the roots of the phalanx[9,10].

According to Acharya Sushruta dose of niruha should be measured with aatura hasta and which is equal to Prasrita[6]. The comment on this by Gayadas acharya proves beyond doubt that Prasrita is not paladvyam, but it is kunchita anguli pani and in Amarkosha it is explained as pani nikubja[8]. But Jejjata Acharya commenting on the same reference clarifies that if aatura hasta is of madhyama purusha then only Prasrita will equal to 2 pala. According to Ayurvedic formulary of India Prasrita or hastamana is 2 pala and which is equal to 96ml.

In classics Prasrita pramana was used for measurement of vasti dravya according to age. In many vasti yoga also these pramana was used eg. Ksheera vasti[11], Madhutailika vasti[12] etc. Sva hasta samitam[13]svaangulimula sammitam[14] are equal to Prasrita matra given in context of Uttarvasti for kashaya and sneha measurement. Thus it is very clear that, a specific dose is mentioned by Acharya for all procedure, where Prasrita pramana is the unit for measurement of drava dravya used in vasti. For all patients quantity of one Prasrita may not be the same. It may vary from person to person as the size of the palm and fingers are different. The quantity of Prasrita also varies according to the drava dravya used for the vasti eg. Madhu, sneha, kashaya etc. Acharya Sushruta has mentioned Aaturahasta pramana for measurement of vasti drava[6].

Dosage Of Niruha Vasti

Scholars of Ayurveda have different opinion in dose of vasti. According to Acharya Sushruta dose of niruha should be measured with aatura hasta and which is equal to prasrita. The quantity of the dravya with which an Aasthaapana Vasti should be done according to age is two, four and eight Prasrita (in volume) respectively. Acharya Charaka mentions the vasti dose in increasing pattern in relation with increasing age. Acharya Sharangadhara has given 3 types of matra of Niruhavasti[15] which is Pravara matra- $1^{1/4}$ prastha, Madhyama matra- 1 prastha and Heena matra-3 kudava

The maximum dose of Niruha vasti is 12 prasrita i.e 24 pala. Different opinion of Ayurveda Scholars regarding dose of vasti with respect to age is shown in tabulation form.

Table no. 2 dose of vasti with respect to age

Age(Years)	Matra in Prasrita(Charaka)[16]	Matra in Prakuncha(Vagbhatta)[17]	Matra in Prasrita(Sushruta)[18]
1	½	1	2 prasrita
2	1	2	
3	$1^{1/2}$	3	
4	2	4	

5	$2^{1/2}$	5	
6	3	6	
7	$3^{1/2}$	7	
8	4	8	4 prasrita
9	$4^{1/2}$	9	
10	5	10	
11	$5^{1/2}$	11	
12	6	12	
13	7	7 prasrita	
14	8	8 prasrita	
15	9	9 prasrita	
16	10	10 prasrita	8 prasrita
17	11	11 prasrita	
18	12	12 prasrita	
18-70	12	12 prasrita	25-70yrs-12 prasrita
Above 70	10	10 prasrita	8 prasrita

After considering different opinion of different scholars regarding dosage of vasti it is clear that Acharya has given the dosage of vasti in prasrita unit. A Prasrita measurement being here is equal to amount that can be contained in the hollowed palm of outstretched hand of the patient. So it is essential to find the relevance of Prasrita or Aaturahasta pramana related to vasti in the present period.

Research Question–

What is the vasti pramana calculated as per classically mentioned aaturhastasammiten in different age groups.

Observation And Result

- Group A (Age group 6-7 Years)- mean Prasrita value is-9.67(in ml)+ 0.62 S.D with S.E of 0.03
- Group B (Age group 12-13 Years)- mean Prasrita value is -20.31(in ml)+ 1.16 S.D with S.E of 0.06
- Group C (Age group 18 Years & Above)- mean Prasrita value is -31.93(in ml)+ 3.56 S.D with S.E of 0.20

Table no. 3 gaussian data distribution (group c)

Volume	Distribution	% distribution	Mean	Std. Deviation	Std. Error of Mean
24	2	0.666667	31.93	3.55	0.2
26	7	2.333333			
28	26	8.666667			
30	58	19.33333			
32	110	36.66667			
34	50	16.66667			
36	19	6.333333			
38	18	6			
40	3	1			
42	3	1			
44	0	0			
46	1	0.333333			
48	1	0.333333			
50	1	0.333333			
52	1	0.333333			

A Gaussian (normal) data distribution for Group C was analyzed for the given volume range of 24 to 52 units, where the highest frequency of occurrence was observed at a volume of 32, with a distribution count of 110, contributing to 36.67% of the total frequency. The mean value for this distribution cluster

was 31.93, with a standard deviation of 3.55 and a standard error of mean of 0.2, suggesting that the data is symmetrically spread around the mean and closely clustered within a small error margin. The frequency gradually increased from the lower volumes (24, 26, 28) to the peak at 32, then decreased symmetrically towards higher volumes (34, 36, 38, and above), demonstrating the typical bell-shaped pattern of a Gaussian distribution. Volumes beyond 40 showed negligible frequencies, supporting the assumption that the data approximates a normal distribution centered around the mean value.

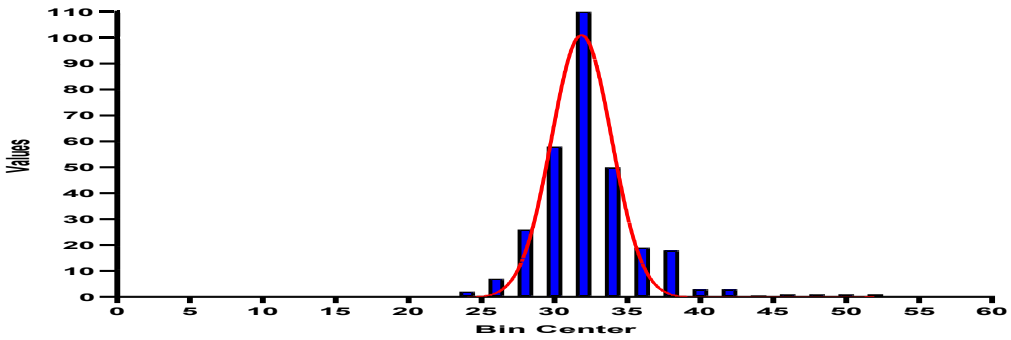


Table no. 4 gaussian data distribution (group b)

Volume	Distribution	% distribution	Mean	Std. Deviation	Std. Error of Mean
17	2	0.666667	20.31	1.16	0.06
18	18	6			
19	42	14			
20	112	37.33333			
21	82	27.33333			
22	35	11.66667			
23	9	3			

The Gaussian data distribution for Group B was analyzed for the volume range of 17 to 23 shows a clear bell-shaped pattern, with the highest frequency recorded at a volume of 20 (112 counts, contributing 37.33% of the total distribution). The mean of this distribution was 20.31, with a standard deviation of 1.16 and a standard error of mean of 0.06, indicating that the data points are tightly clustered around the mean with minimal variability. The frequency gradually rises from lower volumes (17, 18, 19) to the peak at 20, and then symmetrically decreases through higher volumes (21, 22, 23), reflecting a typical normal distribution curve. The high central peak and gradual tapering on both sides confirm the normality assumption, suggesting that the data is well-distributed and centered closely around the mean value.

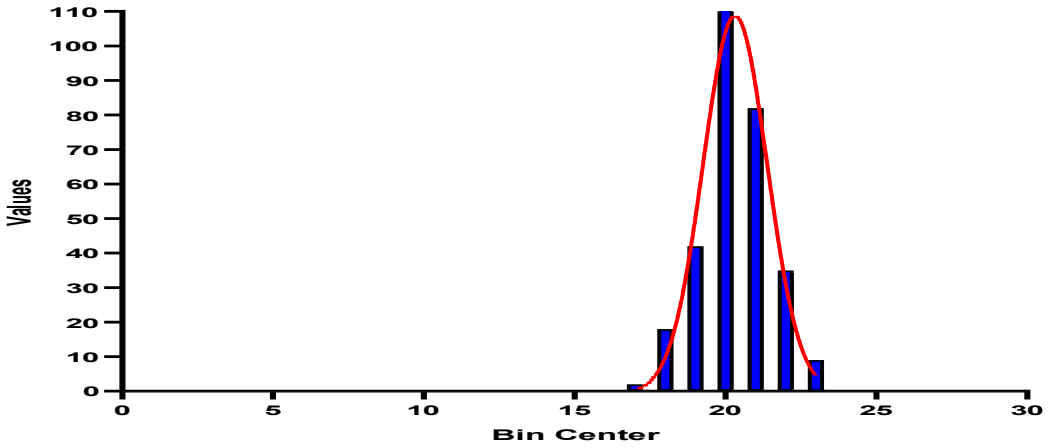


Table no. 5 gaussian data distribution (group a)

Volume	Distribution	% distribution	Mean	Std. Deviation	Std. Error of Mean
8	16	5.333333	9.673333	0.771539	0.044545
9	99	33			
10	159	53			

11	19	6.333333			
12	7	2.333333			

The Gaussian distribution for Group A was analyzed for the volume range of 8 to 12 indicates a clear peak at volume 10, which shows the highest frequency with 159 counts, accounting for 53% of the total data, strongly centralizing the distribution. The calculated mean was 9.67 with a standard deviation of 0.77 and a standard error of mean of 0.0445, implying that the data points are very tightly clustered around the mean with minimal spread. The distribution rises sharply from lower volumes (8 and 9) to the peak at 10, then declines towards higher volumes (11 and 12), illustrating a classic bell-shaped curve that aligns with the characteristics of a normal distribution. This pattern confirms that the dataset is symmetrically distributed with most observations concentrated near the mean, demonstrating low variability and good consistency within this range.

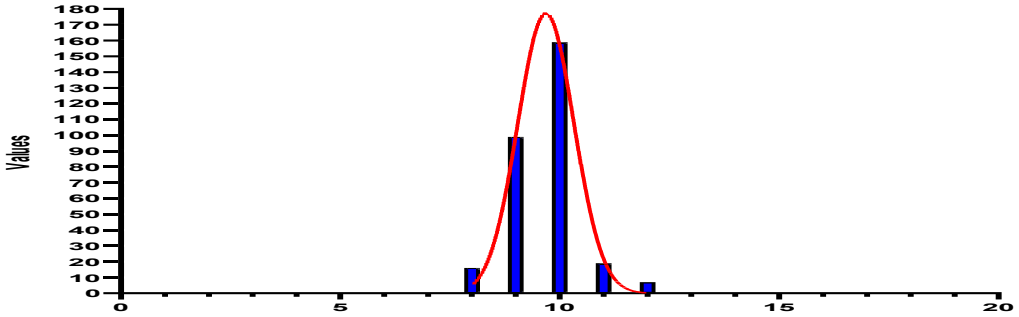


Table no. 6 anova significance among three groups

Tukey's multiple comparisons test	Mean 1	Mean 2	Mean Diff.	ANOVA p Value
Group A vs. Group B	31.94	20.32	11.62	<0.0001
Group A vs. Group C	31.94	9.673	22.26	<0.0001
Group B vs. Group C	20.32	9.673	10.64	<0.0001

A one-way ANOVA was performed to determine whether there were statistically significant differences among the means of the three groups (Group A, Group B, and Group C). The post-hoc Tukey's multiple comparisons test revealed that all pairwise group differences were statistically significant with p-values less than 0.0001. Specifically, the mean difference between Group A (mean = 31.94) and Group B (mean = 20.32) was 11.62; between Group A and Group C (mean = 9.673) was 22.26; and between Group B and Group C was 10.64. The consistently low p-values indicate strong evidence against the null hypothesis, confirming that the differences observed among the three group means are highly significant and unlikely due to random chance.

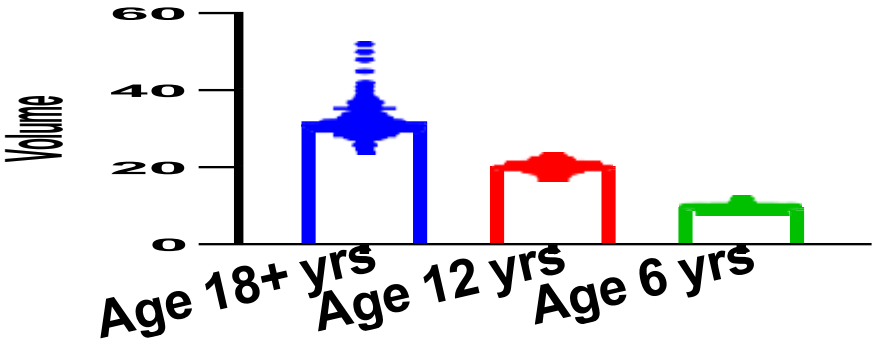
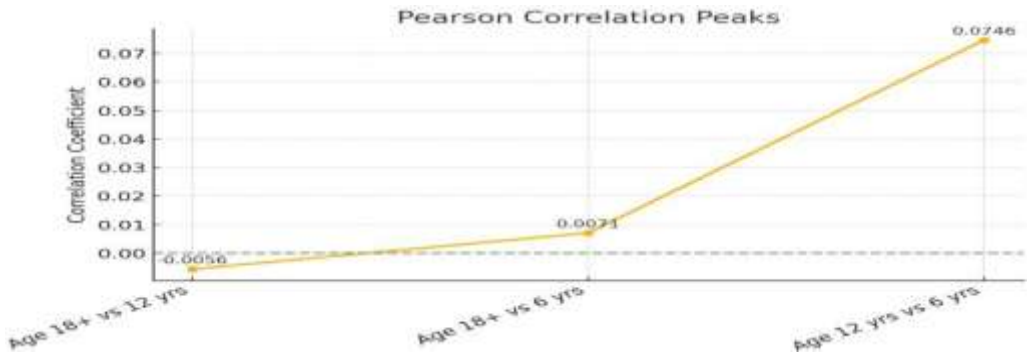


Table no. 7 pearson correlation

Age wise	Age 18+ yrs	Age 12 yrs	Age 6 yrs
Age 18+ yrs	1	-0.00565	0.007069
Age 12 yrs	-0.00565	1	0.074624

Age 6 yrs	0.007069	0.074624	1

The Pearson's correlation analysis was conducted to evaluate the linear relationship among the three age groups: Age 18+ years, Age 12 years, and Age 6 years. The computed coefficients revealed that the correlation between Age 18+ years and Age 12 years was r = -0.00565, indicating a negligible negative relationship, while the correlation between Age 18+ years and Age 6 years was r = 0.007069, suggesting a minimal positive relationship. The highest correlation observed was between Age 12 years and Age 6 years (r = 0.074624), which also indicates a very weak positive relationship. Overall, all the correlation values are very close to zero, reflecting no significant linear association among these age groups in the present data set.



Result And Findings

- The Gaussian data distribution for volumes 24–52 showed a clear bell-shaped curve with a peak at volume 32, a mean of 31.93, a standard deviation of 3.55, and a low standard error of mean (0.2), indicating normal distribution and tight clustering around the mean.
- The second Gaussian distribution for volumes 17–23 demonstrated a peak at volume 20, with a mean of 20.31, a standard deviation of 1.16, and a very low standard error of mean (0.06), confirming precise, symmetric normality.
- The third Gaussian distribution for volumes 8–12 revealed the sharpest peak at volume 10, contributing 53% of the total frequency, with a mean of 9.67, a standard deviation of 0.77, and a minimal standard error of mean (0.0445), showing tight clustering and excellent data consistency.
- The one-way ANOVA showed statistically significant differences among the three groups (Group A, B, and C), with all pairwise mean differences highly significant ($p < 0.0001$).
- Tukey's multiple comparisons test confirmed that the mean differences between Group A vs. Group B (11.62), Group A vs. Group C (22.26), and Group B vs. Group C (10.64) were all significant, supporting true variation among the groups.
- Pearson correlation analysis revealed negligible linear relationships among Age 18+ years, Age 12 years, and Age 6 years, with coefficients near zero (-0.00565 to 0.074624), indicating no meaningful correlation or predictive association.
- Overall, the findings establish that the data were normally distributed, group means differed significantly, and the age groups were statistically independent of each other.

DISCUSSION

The first Gaussian distribution, covering the volume range from 24 to 52, shows a well-defined bell-shaped curve with its peak centered at volume 32, which accounts for 36.67% of the total distribution. The mean of 31.93 aligns closely with this modal value, validating the normality assumption and confirming that the data points are symmetrically dispersed around the central tendency. The standard deviation of 3.55 indicates a moderate spread, while the low standard error of mean (0.2) signifies high precision in estimating the population mean. The gradual increase in frequency from the lower volumes up to the peak, followed by a mirrored decline at higher volumes, demonstrates the classical features of a normal distribution and suggests that the sample is free from major outliers or data skewness.

In the second distribution, covering the volume range from 17 to 23, the data again forms a smooth, symmetrical bell curve with a maximum frequency at volume 20, which contributes 37.33% of the observations. The calculated mean of 20.31 is very close to the peak value, further confirming the normal distribution pattern. The standard deviation of 1.16 shows a narrow spread around the mean, supported

by a very small standard error of mean (0.06), which reflects the reliability and homogeneity of the data. The symmetric rise and fall of frequencies on either side of the mean indicate minimal influence of outliers, reinforcing the suitability of this data for statistical testing that assumes normality.

The third dataset, spanning volumes 8 to 12, demonstrates the clearest normality with an evident peak at volume 10, representing 53% of the total distribution, the highest proportion among the three sets. The mean of 9.67, standard deviation of 0.77, and extremely low standard error of mean (0.0445) together signify tight clustering and excellent consistency of the data around the mean. The sharp ascent to the central peak from lower volumes, followed by an equally steep descent towards the higher volumes, confirms the typical characteristics of a normal Gaussian curve. This consistency suggests strong reliability of the measurements and suitability for further parametric statistical analysis. Together, all three distributions support the robustness of the data, highlighting the normality and stability required for meaningful inferential conclusions.

The one-way ANOVA conducted to compare the means of Group A, Group B, and Group C demonstrated statistically significant differences across all three groups, as confirmed by the post-hoc Tukey's multiple comparisons test. The mean of Group A (31.94) was notably higher than that of Group B (20.32) and Group C (9.673), resulting in mean differences of 11.62 and 22.26 respectively, both with highly significant p-values of less than 0.0001. Similarly, the difference between Group B and Group C was also statistically significant, with a mean difference of 10.64 and the same low p-value threshold. These results provide clear evidence that the observed differences in means are not due to random variation but reflect true differences between the groups. The highly significant p-values reinforce the reliability of these findings and suggest that the groups represent distinct populations or treatments with meaningful variation in their measured outcomes. This strong statistical separation supports the rejection of the null hypothesis of equal means and justifies further interpretation, potential causal inferences, and practical application of these findings within the context of the study's objectives.

The Pearson correlation analysis examining the linear association among the three age groups—Age 18+ years, Age 12 years, and Age 6 years—indicates that the variables are largely independent of each other, as reflected by the near-zero correlation coefficients. The negative correlation between Age 18+ years and Age 12 years ($r = -0.00565$) suggests an almost non-existent inverse relationship, implying that variations in the older age group are not meaningfully linked to changes in the 12-year group. Similarly, the correlation between Age 18+ years and Age 6 years ($r = 0.007069$) is marginally positive but so close to zero that it holds no practical significance, again supporting the conclusion that the two groups vary independently. The highest coefficient observed was between Age 12 years and Age 6 years ($r = 0.074624$), which, while relatively larger than the others, remains extremely weak, further emphasizing that any potential linear relationship is negligible. Collectively, these results demonstrate that age-related measures or variables in these categories do not move together in any predictable manner, and no statistically meaningful linear trend can be inferred among them. This lack of correlation suggests that other factors, rather than age progression alone, might influence the parameters under study in these distinct groups.

CONCLUSION

In conclusion, the comprehensive statistical analyses, including Gaussian distribution assessment, ANOVA, and Pearson correlation, collectively demonstrate robust and interpretable patterns within the dataset. The Gaussian distributions for all three volume ranges confirmed well-defined normal curves with clear central peaks, tight clustering around the means, and minimal standard errors, validating the reliability of the data and its suitability for parametric testing. The one-way ANOVA with Tukey's post-hoc test revealed highly significant differences among the three groups with p-values less than 0.0001, confirming true variation in group means rather than random chance. Meanwhile, the Pearson correlation results indicated negligible to very weak linear relationships among the age groups, suggesting that changes in one age group do not predict or influence the others in this dataset. Together, these findings support the conclusion that the dataset is statistically sound, the group differences are significant, and age-based variables in this context remain largely uncorrelated.

Conflict of interest –nil
Source of support –none

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