IV. RESULTS AND DISCUSSION

In the domain of education, the need for effective assessment scales has become paramount. Many children, despite facing potential learning challenges, go undiagnosed in their formative years, delaying the early interventions which is crucial, can significantly impact their educational path. Early diagnosis is instrumental in facilitating timely and targeted interventions, allowing children to overcome obstacles and fostering a positive developmental trajectory. The development of a reliable and comprehensive assessment scale gains importance.

In essence, the necessity for a robust assessment scale extends far beyond conventional evaluations and emerges as a catalyst for early diagnosis, targeted interventions, and the holistic development of students. Equipping teachers with valuable insights, not only enhances the learning experience for children but also contributes to the overall effectiveness of the educational system.

The study, titled 'Development of Assessment Scale for PRTs to Identify Children with LD,' was steered to address the mentioned necessity. Conducted in the Indian state of Tamil Nadu, specifically in the Coimbatore jurisdiction the research began with a thorough theoretical orientation and an extensive literature review of relevant works. This groundwork laid the foundation for the development of a comprehensive assessment scale, which underwent a face validity test to ensure its appropriateness.

Subsequently, the tool's usability was evaluated in a pilot study involving 133 primary school teachers. The reliability and validity of the pilot data were meticulously analysed and presented in the Methodology section. The actual research data, collected from 514 PRTs, played a crucial role in standardising the assessment scale and the standardisation process. The knowledge, attitude, and practices of teachers were also assessed along with socio-demographic markers. A sensitisation programme was planned, designed and conducted for teachers. The effect of the sensitisation programme was also assessed.

This chapter focuses on the results and discussion obtained from the extensive research endeavour. Results are covered in the subsequent sections.

A. Standardisation of the assessment scale

i. Validity Tests

a. Face Validity and Content Validity

b. Principle Component Analysis and Exploratory Factor Analysis

c. Confirmatory Factor Analysis (Structural Equation Model)

ii. Reliability Tests

a. Cronbach's alpha test (Internal Consistency)

b. Test-Retest Reliability

c. Inter-Rater Reliability (IRR)

d. Sensitivity and Specificity Test

B. Development of norms of the standardised assessment scale and administration

C. Knowledge Attitude Practice (KAP) of primary school teachers on learning disabilities

i. Socio-demographic profile (markers) of the teachers

ii. Level of Knowledge Attitude and Practice (KAP) among primary school teachers on learning disability

iii. Interaction of KAP and Socio-demographic markers of teachers

a. Interaction of KAP of teachers on learning disability

b. Socio-demographic markers and knowledge of primary school teachers on Learning Disability

c. Socio-demographic markers and attitude of primary school teachers on Learning Disability

d. Socio-demographic markers and practice of primary school teachers on Learning Disability

D. Effect of Sensitisation Programme on KAP of teachers

A. Standardisation of the assessment scale

Standardisation is a crucial aspect of research methodology, particularly in developing and utilising assessment scales. Standardisation involves the procedure of ensuring that a test is standardised, as stated by Osadebe in 2001. He defines "Standardisation of a test as a process of producing a standardised test, and it evolves the

establishment of norms". In the research context, standardisation refers to the process of creating a uniform and consistent framework for administering and scoring the tools. It involves establishing specific conditions under which assessments are conducted, ensuring objectivity, reliability, and comparability of results.

The need for standardisation arises from the desire to obtain reliable and valid data that can be consistently interpreted and compared across different individuals, settings, or studies. By eliminating variations in the administration and scoring process, standardisation minimises the impact of extraneous factors, thus enhancing the accuracy and consistency of research findings. (Osadebe, 2001; Ohuche and Akeju, 1988).

Moreover, ensuring the validity and reliability of the assessment scale is paramount. Reliability ensures consistent results over multiple administrations, while validity ensures that the tool measures what it intends to measure. These aspects collectively contribute to the overall quality and credibility of the research. On the whole, standardisation is a meticulous process that not only enhances the quality of research outcomes but also enables researchers to draw meaningful and accurate conclusions from their studies. It establishes a common ground for assessment, allowing for the reliable comparison of data and fostering a more robust foundation for research practices.

i. Validity Tests

Validity in research refers to the extent to which a study accurately reflects or assesses the concept or phenomenon it claims to measure (Andrade C, 2018). Validity is essential in research as it ensures that the methods used to collect data measure what they claim to measure and that the conclusions drawn from the data are also valid. Without validity, the research findings may not accurately represent the phenomenon being studied, leading to unreliable and potentially misleading results. Therefore, establishing validity is crucial to ensure that the research findings genuinely reflect the phenomena they are intended to represent.

a. **Face Validity and Content Validity**

Face Validity is an important aspect of assessing the quality of a research tool, such as a questionnaire. Face validity involves a review of the tool by nonexperts, yet professionals in the field of the target group, who assess its clarity, comprehensibility, and

aptness for the target group. In the current study, the face validity was carried out by two academicians, two school teachers, and one special educator.

Content Validity is a method that helps ensure that the tool appears to measure what it is intended to measure and is relevant, and also, determines the appropriateness for its intended use. In this research, content validity was carried out with nine experts including two Professors from the Department of Human Development, three Development Paediatrician, one Neurologist, one Professor from the Department of Special Education, one Clinical Psychologist, and one Special Educator. The process of face validity is explained in detail in the Methodology chapter (page no.61 - 64). This process helps ensure that the tool covers all relevant parts of the construct it aims to measure and that the experts' opinions contribute to the validation of the instrument.

***b*. Principle Component Analysis (PCA) and Exploratory Factor Analysis (EFA)**

PCA is a method used to reduce the dimensionality of data while preserving its underlying structure. It can be used to identify the latent components that explain the variance in the data, which can help in understanding the structure of the construct being measured. In the context of content validity, PCA can be used to analyse the patterns of inter-item correlations among the items in the scale, providing insights into the underlying structure of the construct and helping to identify any highly correlated items that may affect the content validity of the instrument. (Hair et all 2006; Dziuban and Shirkey, 1974)

The procedure for Factor Analysis are a) assessment of the suitability of the data, b) factor extraction, and c) factor rotation and interpretation.

Step 1: Assessment of the suitability of the data

While eyeballing is a valid method of statistical analysis some type of statistic, preferably with an associated probability density function to produce a p-value, would be useful to help us make this decision. Two such statistics are the Bartlett test of Sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (usually called the MSA). The Bartlett Test of Sphericity compares the correlation matrix with a matrix of zero correlations (technically called the identity matrix, which consists of all zeros except the 1’s along the diagonal). From this test, we are looking for a small p-value indicating that it is highly unlikely for us to have obtained the observed correlation matrix from a population with zero correlation. (Norman and Streiner, 2008). According to Norman and Streiner

(2008), Measures of Sampling Adequacy (MSA) do not produce a P value but a value over 0.8 is considered as good sample adequacy. A value below 0.5 is considered to be miserable and it is recommended that consider removing variables with an MSA below 0.7.

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy

The KMO test is a statistical tool to evaluate the suitability of data for factor analysis. The evaluation evaluates the appropriateness of the sampling for both the entire model and each variable. The statistic represents the proportion of variation among variables that could be considered common variance.

KMO measure of sampling adequacy is calculated using the formula:

$$KMD_J = \frac{\sum_{i \neq j} {R_{ij}}^2}{\sum_{i \neq j} {R_{ij}}^2 + \sum_{i \neq j} {U_{ij}}^2}$$

where, Rij is the correlation matrix and Uij is the partial covariance matrix (Shrestha, 2021)

KMO has values between 0 and 1. A **rule of thumb** for interpreting the statistic:

- KMO values between 0.8 and 1 indicate the sampling is adequate.
- KMO values less than 0.6 indicate the sampling is not adequate and that remedial action should be taken.
- KMO Values close to zero mean that there are large partial correlations compared to the sum of correlations. In other words, there are widespread correlations which are a large problem for factor analysis.

According to Vogt (2005). Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences. For reference, Kaiser put the following values on the results:

- 0.00 to 0.49 unacceptable.
- 0.50 to 0.59 miserable.
- 0.60 to 0.69 mediocre.
- 0.70 to 0.79 middling.
- 0.80 to 0.89 meritorious.
- 0.90 to 1.00 marvellous.

Bartlett's Test of Sphericity

Bartlett's Test of Sphericity tests the null hypothesis (H_0) that the variables are orthogonal, meaning the original correlation matrix is an identity matrix and the variables

are unrelated, making them unsuitable for structure detection. The alternative hypothesis (H_1) posits that the variables are not orthogonal and are sufficiently correlated, causing the correlation matrix to significantly diverge from the identity matrix.

According to Guttman (1954), a significance value of less than 0.05 indicates that factor analysis may be appropriate for the dataset. Despite the age of Guttman's study, its principles continue to remain relevant and are still utilised in recent research, such as by Shrestha (2021), because they are suitable for current data analysis methods.

To assess the overall relationship between the variables, the determinant of the correlation matrix |R| is calculated. Under the null hypothesis (H_0), |R| equals 1, indicating no correlation among the variables. If the variables are highly correlated, then |R| approaches 0. Bartlett's Test of Sphericity is expressed as follows:

$$X^2 = -\left(n - 1 - \frac{2p+5}{6}\right) \text{ x } 1n\,|R|$$

Where p is the number of variables, n is the total sample size and R is the correlation matrix.

Table XVIII

KMO and Bartlett's Test of the Developed Assessment Scale

	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.959
Bartlett's Test of Sphericity	Approx. Chi-Square	18260.785
	Df	1128
	Sig.	.000

The KMO value of the developed assessment scale in the current research study is found to be .959 which indicates the sampling is adequate and the data is suitable for factor analysis. It could be inferred from the analysis of anti-image matrices (Anti-image Correlation) that a good value for all variables for the Measures of Sampling Adequacy (MSA) is 0.9 and Bartlett's Test of Sphericity has an associated P value of 0.000 indicating that the data is suitable for a valid factor analysis.

Step 2: Factor Extraction - Determining the Number of Factors to Extract

Kaiser's criterion and the scree test are employed to ascertain how many initial unrotated factors should be extracted. The eigenvalues corresponding to each factor indicate the variance explained by those particular linear components. Factors with loadings below 0.4 are disregarded, thus eliminating any presentations of factor loadings below this threshold.

These two techniques are utilised to help decide the number of factors to retain: Kaiser's Criterion and the Scree Test. Both methods assist in identifying the number of initial unrotated factors to extract. Kaiser's Criterion also known as the Eigenvalue Criterion, involves retaining factors with eigenvalues greater than 1. Scree Test, this visual test involves plotting the eigenvalues and identifying the point where the slope of the curve levels off, which indicated the number of factors to retain.

The eigenvalue represents the ratio between the common variance and the specific variance explained by a particular extracted factor (Shrestha, 2021).

The Kaiser's criterion or Eigenvalue Criterion

The eigenvalue of a factor represents the amount of total variance explained by that factor. In factor analysis, factors with eigenvalues greater than one are retained, as they are considered significant. This rule is based on the rationale that an eigenvalue greater than one indicates that the factor explains more common variance than unique variance (Kaiser, 1970).

Table XIX

Eigenvalues, Percentages of Variance and Cumulative Percentage for factors for 48 extracted items

Factor	Eigenvalue	% of variance	Cumulative %
1	21.13	44.02	44.02
2	2.51	5.23	49.26
3	2.15	4.48	53.74
4	1.96	4.07	57.81
5	1.53	3.18	60.99
6	1.12	2.33	63.32
7	1.09	2.26	65.58
Extraction Method: Principal Component Analysis.			

The total variant explained in Table XIX. The total variance explained indicates how much of the variability in the data has been modelled by the extracted factors. Analyses are reported with 60-70% of the Total Variance (Cumulative %) accepted. The Cumulative percentage obtained for this data is 65.58% indicating that the assessment scale was at an acceptable level with reconcerning variance.

Eigenvalues - As a general guideline, choose components whose Eigenvalues are at least 1. Using this straightforward rule, it appears that 48 extracted items in Table XIX measure 7 underlying factors. All seven factors have Eigenvalues of at least 1.

Scree Test

Cattell (1996) proposed a graphical method for determining the number of factors to extract. A scree plot is created by plotting the eigenvalues on the vertical axis and their corresponding numbers on the horizontal axis. The eigenvalues are represented as dots connected by a line. Factor extraction should be stopped at the point where the plot forms an 'elbow' or levels off. This test helps identify the optimal number of factors to extract before the unique variance starts to overshadow the common variance structure (Hair, et al 1998, Cattel 1966).

The 48 extracted items' underlying real traits are not thought to be represented by the other components, which have poor quality scores. The line graph below demonstrates how such components are referred to as "scree" as shown by the line chart below (Figure 6).

Scree Plots

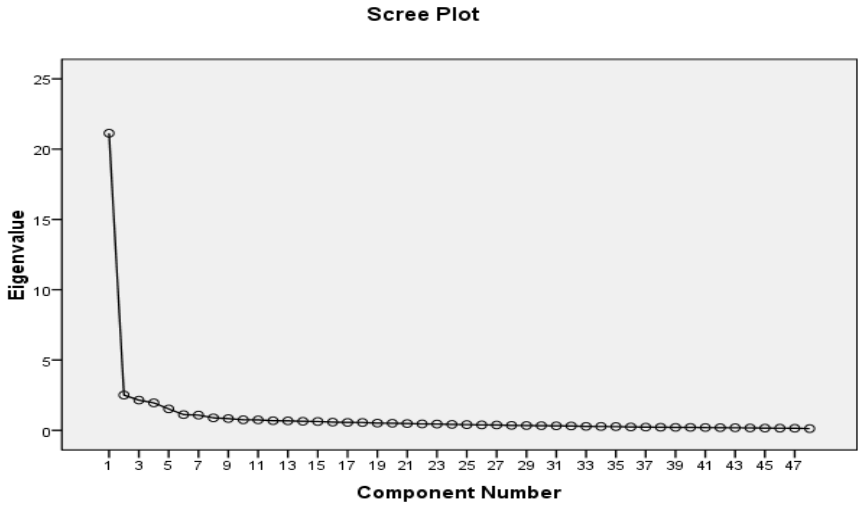


Figure 6

A scree plot visualises the Eigenvalues (quality scores). It could be noted from the scree plot that the first 7 components have Eigenvalues over 1. Considering these as "strong factors". After that -component 8 and onwards- the Eigenvalues **drop off dramatically**. The sharp drop between components 1-7 and components 8-16 strongly suggests that 7 factors underlie the assessment items.

Step 3: Factor Rotation and interpretation

The extraction method employing PCA and the orthogonal rotation method based on varimax with Kaiser had been implemented. Table XX exhibits Factor loading and Communalities after extractions. Factor loading and Communalities for varimax rotated indicate the shared variance within the data structure following factor extraction. Factor loading values indicate how each variable relates to the underlying factors. Variables with substantial loading values (> 0.40) are indicative of their representation by the factor.

Exploratory factor analysis

Exploratory factor analysis is one of the main types of factor analysis. In exploratory factor analysis, each observed variable is potentially a measure of every factor, and the goal is to determine relationships (between observed variables and factors) are strongest.

Extracting the factors: All factor analysis techniques try to clump subgroups of variables together based on their correlations and often get a feel for what the factors are going to be just by looking at the correlation matrix and spotting clusters of high correlations between the groups of variables.

An exploratory-factor analysis (varimax rotation) on the data from a sample of 514 primary school teachers was conducted on the 96 items using orthogonal rotation (varimax). Totally 48 items were excluded from this analysis and significantly loaded onto 7 components (table XX).

According to Norman and Streiner (2008) and Tabachnick and Fidell (2007), if there are few correlations above 0.3 it is a waste of time carrying on with the analysis, clearly, in the current analysis we do not have that problem. Furthermore, the Correlation matrix of many items above 0.3 and possible clustering is a good sign of Correlation. The correlation matrix of the current data indicates many items above 0.4 and possible clustering which is a good sign of correlation.

Table XX

Factor loading and Communalities

Factor loading and Communalities for varimax rotated Seven-factors solution for 48 assessment scale items (n=514)

Factor loading and Communalities for varimax rotated Seven-factor solution for 48 screening items were categorised Assessment Scale Items.	Factor Loading							Communalities
	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	
The child cannot solve word problems or statement problems	.51				.44			.67
The child has trouble relating concepts like before and after, now and then, today and tomorrow	.54							.57
The child has a poor understanding of spoken language and requests to repeat.	.62							.55
The child purposefully lowers the voice and reads without understanding	.65							.67
The child has difficulty in using words while reading and writing	.73							.70
The child lacks ideas for expressing themselves	.55				.42			.63
The child misunderstands what he/she hears	.59							.65
The child has a very poor vocabulary	.60							.67
The child does not write the appropriate letters when given the sound	.64							.72
The child erases frequently while drawing	.59							.63

Factor loading and Communalities for varimax rotated Seven-factor solution for 48 screening items were categorised Assessment Scale Items.	Factor Loading							Communalities
	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	
The child shows a dislike for drawing	.57							.64
The child adds letters (for ex: lie – lied, sip – slip) in between while reading		.59						.61
The child puts letters in the wrong order while reading (for ex: felt as left, act as cat)		.50						.60
The child has difficulty writing across the paper in a straight line		.62						.57
The child reverses letters (for ex: b – d, p – q, m - w) while writing		.72						.69
The child writes the words backward while writing (for ex: b – d, on – no, saw - was)		.68						.67
The child puts letters in the wrong order while writing (for ex: felt as left, act as cat)		.71						.70
The child inverts words (n for u; m for w) while writing		.67						.72
The child omits letters (limp – lip, went – wet) while writing		.67						.70
The child adds letters (lie – lied, sip – slip) in between while writing		.58						.60

Factor loading and Communalities for varimax rotated Seven-factor solution for 48 screening items were categorised Assessment Scale Items.	Factor Loading							Communalities
	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	
While reading the words the child reads them backwards (for ex: now – won, raw- war)			.55					.50
The child distorts alphabets while writing			.66					.67
The child cannot remember certain letters while writing	.44		.64					.70
The child's handwriting is not legible			.64					.62
The child confuses directions (uses mirror image writes C as Ɔ)			.75					.78
The child cannot copy simple shapes			.73					.70
The child does not copy from other print material (from the board or books)			.62		.44			.66
The child holds a pencil or pen awkwardly			.61					.63
The child is not able to retain information				.58				.62
The child is not able to recall information				.61				.61
The child constantly seeks attention				.63				.54

Factor loading and Communalities for varimax rotated Seven-factor solution for 48 screening items were categorised Assessment Scale Items.	Factor Loading							Communalities
	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	
The child does not use effective strategies to complete the tasks successfully.				.67				.60
The child does not have the organising ability				.74				.68
The child is impulsive and fails to think about the consequences of behaviour				.69				.65
The child fails to complete the given tasks	.42			.57				.61
The child cannot copy symbols					.67			.73
The child has difficulty making mental calculations					.74			.78
The child is confused about basic mathematical operations (subtraction, addition, word problems, division, multiplication, any other)					.71			.72
The child does not understand place values					.67			.70
The child cannot follow sequences in multi-step problems		.41			.51			.69
The child has difficulty with mathematical procedures					.58			.61
The child destroys others' property						.78		.73

Factor loading and Communalities for varimax rotated Seven-factor solution for 48 screening items were categorised Assessment Scale Items.	Factor Loading							Communalities
	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Component 7	
The child takes /steals others' things without permission						.82		.74
The child does not obey class rules						.62		.65
The child disrupts the class						.54		.53
The child is clumsy and awkward on the playground							.62	.66
The child is unable to perform simple exercises such as toe-touching, running, jumping, skipping.							.79	.80
The child is unable to involve eye-hand coordination movements such as tracing, needlework, bead stringing, lacing, colouring, drawing, writing or buttoning.							.58	.63
Extraction Method: Principal Component Analysis. a. 7 components extracted.								

Factor loadings for the correlation between a specific observed variable and a specific factor. Higher values mean a closer relationship. They are equivalent to standardised regression coefficients (β weights) in multiple regression. The higher value indicates a better correlation.

Communality is the total influence on a single observed variable from all the factors associated with it. It is equal to the sum of all the squared factor loadings for all the factors related to the observed variable and this value is the same as R^2 in multiple regression. The value ranges from zero to 1, where 1 indicates that the variable can be fully defined by the factors and has no uniqueness. Communality is a numerical measure of how much an item's variance is being captured by the factor model. Any value nearing 1 is ideal and a value near 0 is not accepted. According to Principal Axis Factoring with Promax rotation, Osborne, Costello, and Kellow (2008) suggest the commonalities above 0.4 is acceptable and in this study the level of the items ranges from 0.5 to 0.8, indicating that the items in the range of acceptable level to ideal communality value.

Giving meaning to the extracted factors

Rotated component matrix gives the idea of "**which variables measure which factors?**". Technically, a factor (or component) represents whatever its variables have in common. The obtained rotated component matrix shows that the first component is measured by the following items.

Component 1 - Perceptual ability

- The child cannot solve word problems or statement problems
- The child has trouble relating concepts like before and after, now and then, today and tomorrow
- The child has a poor understanding of spoken language and requests for repeating again
- The child purposefully lowers the voice and reads without understanding
- The child has difficulty using words while reading and writing
- The child lacks ideas for expressing themselves
- The child misunderstands what he/she hears
- The child has a very poor vocabulary

- The child does not write the appropriate letters when given the sound
- The child erases frequently while drawing
- The child shows a dislike for drawing

These items relate to the Perceptual ability of the children. Therefore, component 1 is interpreted as “Perceptual ability”.

The following components are obtained by measuring similar items.

Component 2 - Executing Reading and writing

Component 3 - Thought process in Reading and writing

Component 4 – Cognitive functioning

Component 5 - Mathematical ability

Component 6 – Classroom behaviour

Component 7- Motor skills

Table XXI
Factor Correlation: Component Transformation Matrix

Component	Component 1 Perceptual ability	Component 2 Executing Reading and writing	Component 3 Thought process in Reading and writing	Component 4 Cognitive functioning	Component 5 Mathematical ability	Component 6 Classroom Behaviour	Component 7 Motor skills
Component 1 Perceptual ability	.485	.455	.407	.381	.380	.211	.241
Component 2 Executing Reading and writing	-.460	.459	-.141	.045	-.213	.712	-.060
Component 3 Thought process in Reading and writing	-.028	-.464	.339	.586	-.531	.163	.129
Component 4 Cognitive functioning	-.241	.074	.771	-.545	-.136	-.044	.157
Component 5 Mathematical ability	-.519	-.276	.235	.269	.651	.040	-.318
Component 6 Classroom behaviour	-.081	-.373	-.206	-.179	.285	.310	.777
Component 7 Motor skills	.467	-.382	.083	-.330	.067	.568	-.439

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalisation.

The Rotated Component Matrix displays the loadings for each item on each rotated component, again clearly showing which items make up each component.

The most popular rotation approach is called **Varimax**, which maximises the differences between the loading factors while maintaining orthogonal axes. The Component Transformation Matrix displays the correlations among the components before and after rotation. A value of more than 0.8 is not accepted, as a score of more than 0.8 indicates a high correlation. Hence table XXI shows the components' values are less than 0.8.

In discussing the application of Principal Component Analysis (PCA) in research, Muzamhindo et al. (2017) demonstrated its use as a ranking tool for evaluating world universities. In their study, standardised variables were analysed using PCA to determine quality levels, which informed university rankings. the study highlighted that different methodologies can yield varying results. Unlike traditional methods, PCA assigns weights based on the data itself, offering an objective approach to ranking. The correlation matrix and total variance explained were critical aspects of the analysis, with 78% of the total variation captured by the first three principal components, each having eigenvalues greater than one. The study concluded that PCA, by focusing on principal components accounting for the most significant variations, offers a robust methodology for ranking. In Noora Shrestha's 2021 study on tourist satisfaction, factor analysis was employed using questionnaire data. The KMO measure of 0.813 confirmed sampling adequacy, and Bartlett’s test of sphericity was highly significant, indicating correlations among variables. Using Kaiser’s criterion and the scree test, three factors were extracted, explaining 60.2% of the total variance, exceeding the 50% threshold. Varimax rotation was applied to enhance factor interpretability, and reliability was confirmed through strong Cronbach's alpha and composite reliability values. In this study, PCA was applied PCA to analyse data, using tests such as the KMO, Bartlett’s Test of Sphericity, and factor rotation, to gain insights and establish valid constructs.

In comparison, the current study similarly applied PCA, with a KMO value of 0.959, indicating even greater sampling adequacy. Bartlett's test was significant at the 1% level, confirming appropriate correlations among the variables. The analysis revealed seven factors explaining 65.58% of the total variance, suggesting a robust assessment scale. The Scree test indicated a sharp drop between components 1-7, aligning with the extraction of seven meaningful factors. Factor loadings were mostly above 0.4, with communalities ranging from

0.5 to 0.8, demonstrating acceptable to ideal levels. In both studies, Varimax rotation was employed to enhance the clarity of factor structures. The current study identified Component 1 as "Perceptual Ability," reflecting a coherent underlying construct. The Component Transformation Matrix confirmed low correlations among factors, with values under 0.8, indicating distinct factors.

These findings suggest that PCA is a powerful tool for uncovering underlying structures in survey data, offering valuable insights into the key factors influencing the constructs being measured. The results from both studies demonstrate the effectiveness of PCA in providing reliable and interpretable factors, which can significantly aid decision-making processes.

c. Confirmatory Factor Analysis (CFA) - Structural Equation Modeling (SEM)

To further validate the standardised tool that comprised 48 items and 7 components after EFA, a Confirmatory Factor Analysis (CFA) using Structural Equation Modeling (SEM) was conducted. This rigorous step aimed to confirm and refine the relationships between the observed variables (items) and their underlying latent constructs (components) identified through PCA and EFA. The CFA in SEM serves as a confirmatory test, allowing for the assessment of the theoretical model's fit to the observed data. The process involved specifying a predefined theoretical model based on the results obtained from the PCA which served as the foundation for the CFA. This model outlined the expected relationships between the observed items and their respective latent components (Santor et al. 2011). The CFA analysis then assessed how well the proposed model aligned with the observed data, gauging the consistency of the identified components and their associated items. SEM can help assess the instrument's content validity by examining the model's goodness-of-fit, which indicates how well the model fits the data and how well the latent variables are measured by their corresponding observed variables.

Through this confirmatory testing, the study sought to validate and refine the factor structure of the standardised tool. The analysis examined the goodness-of-fit indices, such as the Comparative Fit Index (CFI), Goodness-of-Fit (GFI), and Root Mean Square Error of Approximation (RMSEA), among others, to evaluate the model's adequacy in explaining the observed variance.

Table XXII

Model fit Indices of SEM

Model fit indices	**Model fit indices**
CFI = 0.90 **GFI = .806**	Good Fit
PCFI = 0813	Parsimony comparative fit index - Greater than 0.50
RMSEA = .062	Root Mean Square Error of Approximation (values between 0.05 and 0.08 indicate acceptable fit

Source: Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural Equation Modeling : Guidelines for Determining Model Fit. *The Electronic Journal of Business Research Methods*, *6*(1), 53–60

The CFI value of 0.90 and GFI value of .806 indicated Goof Fit. Parsimony comparative fit index - Greater than 0.50 and Root Mean Square Error of Approximation (RMSEA=.062) values between 0.05 and 0.08 indicate acceptable fit (Hooper et al., 2008).

Ultimately, the CFA using SEM provided valuable insights into the robustness of the standardised scale, offering confirmation and refinement of the underlying structure established through PCA. This comprehensive approach enhances the reliability and validity of the measurement instrument, ensuring its suitability for capturing the intended constructs consistently and accurately. This method is closely connected to Exploratory Factor Analysis, where latent variables are referred to as factors, and the weights assigned to items are denoted as factor loadings. Structural Equation Modeling (SEM) encompasses various multivariate analysis techniques, such as factor analysis and path analysis. The American Psychological Association (APA, 2018) defines SEM comprises a diverse set of analytical methods that delve into the complex interconnections among latent variables within a given model.

In a 2018 study by Kanyama et al., structural equation models were enhanced using factor analysis. PCA was used to derive provisional factors, refined through factor analysis to reduce variables. These components were integrated into SEMs to explore latent variable associations, revealing that energy, transport, labour, and fertiliser positively impact food production. In the current study, PCA was employed for factor reduction to refine relationships between observed variables and latent constructs. The CFA in SEM assessed the

model's fit, confirming the robustness of the scale. This comprehensive approach enhances the reliability and validity of the measurement instrument, ensuring accurate construct capture. SEM involves techniques like factor and path analysis, exploring complex interconnections among latent variables. Another study by Tavakoi and Wetzel (2020) found that the factor solution derived from an Exploratory Factor Analysis (EFA) offers a snapshot of the statistical relationships among key behaviours, attitudes, and dispositions related to the construct of interest. This snapshot provides essential evidence for the measure's validity by aligning the test content with the theoretical framework underpinning the construct. Additionally, the relationships between factors identified through EFA and confirmed with CFA help researchers interpret the theoretical connections between the underlying dimensions of a construct, extending to relationships across constructs within a broader theoretical model.

Model fit of SEM

Model Fit with factor loadings.

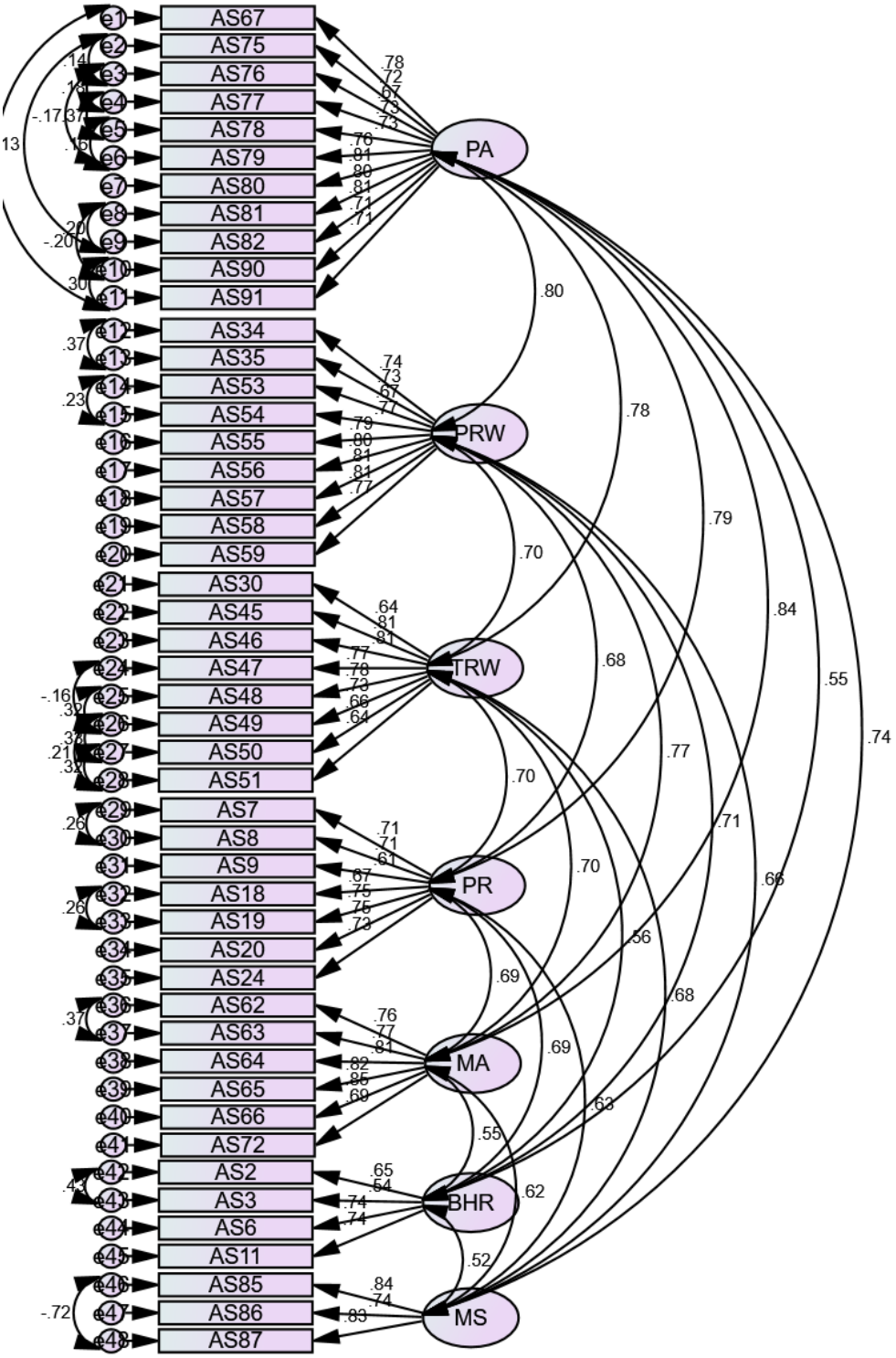


Figure 7

Hence, hypothesis Ha1 stated “the developed Assessment Scale has sufficient model fit indices indicating the goodness of fit” was accepted.

ii. Reliability of the developed assessment scale

Reliability describes the consistency with which results are obtained (Andrade, 2018). Reliability testing is conducted to assess the consistency and stability of a measurement instrument or a set of data over time, across different conditions, or among different observers.

***a*. Cronbach's alpha test (Internal Consistency)**

Reliability tests, such as Cronbach's alpha, assess how consistently items within a scale or instrument measure the same underlying construct. Higher internal consistency indicates that the items are uniformly measuring the concept.

After the Factor analysis of the assessment scale, a total of 48 items under 7 components were extracted. For the process of standardisation, the scale’s reliability needed to be checked. To check the reliability of the developed assessment scale it was subjected to a reliability test with Cronbach’s alpha test.

Cronbach’s alpha reliability test

The assessment scale comprised 48 items in total. Table XXIII*a* shows the scale's reliability. The Cronbach's alpha was 0.972, which indicated that there was excellent reliability. Also, Table XXIII*b* showed item reliability, with Cronbach's alpha values between 0.971 and 0.972, showed excellent reliability.

Table XXIII *a*

Reliability of assessment scale

N	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	48	136.02	42.411	0.972

Table XXIII *b*

Item analysis of assessment scale

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q67	2.78	1.381	.971
Q75	2.87	1.327	.972
Q76	2.86	1.272	.972
Q77	2.90	1.342	.972
Q78	2.92	1.362	.972
Q79	2.79	1.336	.971
Q80	2.82	1.319	.971
Q81	2.87	1.346	.971
Q82	2.95	1.323	.971
Q90	2.94	1.369	.972
Q91	2.77	1.350	.972
Q34	2.64	1.314	.972
Q35	2.67	1.266	.971
Q53	2.85	1.384	.972
Q54	2.78	1.286	.972
Q55	2.64	1.382	.972
Q56	2.70	1.334	.972
Q57	2.68	1.363	.971
Q58	2.75	1.352	.971
Q59	2.73	1.331	.971
Q30	2.71	1.358	.972
Q45	3.11	1.373	.972
Q46	3.11	1.358	.972
Q47	3.19	1.356	.972
Q48	3.00	1.417	.972
Q49	3.11	1.404	.972
Q50	2.94	1.367	.972
Q51	2.96	1.352	.972
Q7	2.92	1.277	.972

Q8	2.97	1.350	.972
Q9	2.96	1.429	.972
Q18	2.89	1.355	.972
Q19	2.86	1.339	.972
Q20	2.90	1.324	.972
Q24	2.88	1.344	.972
Q62	2.81	1.327	.972
Q63	3.01	1.404	.972
Q64	2.99	1.326	.972
Q65	2.90	1.311	.972
Q66	2.85	1.390	.971
Q72	3.04	1.369	.972
Q2	2.19	1.251	.972
Q3	2.06	1.271	.973
Q6	2.67	1.306	.972
Q11	2.51	1.318	.972
Q85	2.88	1.274	.972
Q86	2.84	1.333	.972
Q87	2.86	1.322	.972

Reliability analysis of component 1 - Perceptual ability

There was a total of 11 items in component 1 - Perceptual ability (table XXIV*a*). The reliability of Cronbach's alpha of perceptual ability was 0.935, which demonstrated excellent reliability. The item analysis was found in Table XXIV*b*, and Cornbach's alpha values ranged from 0.926 to 0.931, which indicated excellent reliability.

Table XXIV *a*

Reliability analysis of componen1 - Perceptual ability

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	11	31.47	11.455	0.935

Table XXIV *b*

Item analysis of componen1 - Perceptual ability

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q67	2.78	1.381	.929
Q75	2.87	1.327	.930
Q76	2.86	1.272	.931
Q77	2.90	1.342	.928
Q78	2.92	1.362	.928
Q79	2.79	1.336	.928
Q80	2.82	1.319	.927
Q81	2.87	1.346	.927
Q82	2.95	1.323	.926
Q90	2.94	1.369	.930
Q91	2.77	1.350	.930

Reliability analysis of component 2 - Executing Reading and Writing

The reliability of component 2 and its item reliability are both at an excellent level, according to Tables XXV*a* and XXV*b*, which showed that the component's Cronbach's alpha was 0.928 and the item-wise reliability ranged from 0.918 to 0.926.

Table XXV *a*

Reliability analysis of component 2 - Executing Reading and writing

N	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	9	24.45	9.584	0.928

Table XXV *b*

Item analysis of component 2 - Executing Reading and writing

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q34	2.64	1.314	.921
Q35	2.67	1.266	.922
Q53	2.85	1.384	.926
Q54	2.78	1.286	.919
Q55	2.64	1.382	.919
Q56	2.70	1.334	.918
Q57	2.68	1.363	.918
Q58	2.75	1.352	.918
Q59	2.73	1.331	.922

Reliability analysis of component 3 - Thought process in Reading and Writing

Inferring tables XXVI*a* and XXVI*b*, it was evident that the Cronbach's Alpha reliability of the component 3 - Thought process in Reading and Writing (with 8 items) was 0.908 and the item-wise reliability ranged from 0.891 to 0.904 denoted that this component had a excellent reliability range.

Table XXVI *a*

Reliability analysis of component 3- Thought process in Reading and writing

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	8	24.12	8.562	0.908

Table XXVI *b*

Item analysis of component 3 - Thought process in Reading and writing

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q30	2.71	1.358	.904
Q45	3.11	1.373	.893
Q46	3.11	1.358	.893
Q47	3.19	1.356	.897
Q48	3.00	1.417	.891
Q49	3.11	1.404	.891
Q50	2.94	1.367	.898

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q30	2.71	1.358	.904
Q45	3.11	1.373	.893
Q46	3.11	1.358	.893
Q47	3.19	1.356	.897
Q48	3.00	1.417	.891
Q49	3.11	1.404	.891
Q50	2.94	1.367	.898
Q51	2.96	1.352	.900

Reliability analysis of component 4- Cognitive functioning

Cognitive functioning, which made up component 4 of the assessment scale, had seven items. Tables XXVII*a* and XXVII*b* demonstrated the component's reliability as well as item analysis. The item-wise Cronbach's alpha reliability ranged from 0.852 to 0.874, The Cronbach's alpha reliability of the component was 0.878, which showed that they have good reliability.

Table XXVII *a*

Reliability analysis of component 4 – Cognitive functioning

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	7	20.37	7.164	0.878

Table XXVII *b*

Item analysis of component 4- Cognitive functioning

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q7	2.92	1.277	.861
Q8	2.97	1.350	.859
Q9	2.96	1.429	.874
Q18	2.89	1.355	.863
Q19	2.86	1.339	.852
Q20	2.90	1.324	.857
Q24	2.88	1.344	.861

Reliability analysis of component 5 - Mathematical ability

The Cronbach's alpha reliability of component 5 was found to be 0.908, which showed that component 5 had excellent reliability. Table XXVIII*b* revealed the item-wise reliability ranged from 0.887 to 0.906, which indicated that the items in component 5 are from good to excellent reliability.

Table XXVIII *a*

Reliability analysis of component 5 - Mathematical ability

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	6	17.60	6.729	0.908

Table XXVIII *b*

Item analysis of Mathematical ability

Item No.	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q62	2.81	1.327	.890
Q63	3.01	1.404	.887
Q64	2.99	1.326	.887
Q65	2.90	1.311	.888
Q66	2.85	1.390	.891
Q72	3.04	1.369	.906

Reliability analysis of component 6 – Classroom behaviour

There are 4 items in component 6 – **Classroom behaviour.** From Table XXIX*a*, Cronbach's alpha reliability of the component was found to be 0.797, which showed that component 7 has acceptable reliability. Table XXIX*b* revealed the item-wise reliability ranged from 0.716 to 0.759, this range indicated that the items in component 6 had acceptable reliability.

Table XXIX *a*

Reliability analysis of Component 6 - Classroom behaviour

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	4	9.42	4.056	0.797

Table XXIX *b*

Item analysis of Classroom behaviour

	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q2	2.19	1.251	.716
Q3	2.06	1.271	.752
Q6	2.67	1.306	.757
Q11	2.51	1.318	.759

Reliability and Item analysis of component 7 - Motor skills

The assessment scale's seventh component, motor abilities, had three items. According to table XXX*a* is given below, the component reliability score of 0.803, and component 7 had acceptable reliability. The component's item-level reliability ranged from 0.650 to 0.778, which indicated the items' reliability was in an acceptable range.

Table XXX *a*

Reliability analysis of component 7 - Motor skills

n	Number of items	Mean	SD	Reliability Cronbach's Alpha
514	3	8.58	3.327	0.803

Table XXX *b*

Item analysis of Motor Skills

	Mean	Std. Deviation	Reliability Cronbach's Alpha
Q85	2.88	1.274	.755
Q86	2.84	1.333	.650
Q87	2.86	1.322	.778

The Assessment Scale and its components' reliability and internal consistency were examined, and all 48 items under the seven components were saved because Cronbach's alpha level for these ranged from good to excellent reliability level.

***b*. Test-Retest Reliability**

Test-retest reliability is a metric of reliability that is acquired by giving the same test to a group of people twice over time. The test can then be assessed for consistency over time by correlating the results from Tests 1 and 2. In other words, administer the same test to the same individuals twice at various times to determine whether the results are the same.

Statistically, Pearson's correlation Coefficient was used to determine the connection between the two tests. The linear association between two factors is measured by the Pearson Correlation Coefficient, commonly abbreviated as r. Following are the levels of the Pearson Correlation Coefficient range

Table XXXI

Ranges used to interpret the Pearson Correlation Coefficient value

Value of Correlation Coefficient	Relationship Interpretation
.90 to 1.00 (−.90 to −1.00)	Very high positive (negative) correlation
.70 to .90 (−.70 to −.90)	High positive (negative) correlation
.50 to .70 (−.50 to −.70)	Moderate positive (negative) correlation
.30 to .50 (−.30 to −.50)	Low positive (negative) correlation
.00 to .30 (.00 to −.30)	negligible correlation

Source : Hinkle DE, Wiersma W, Jurs SG (2003). *Applied Statistics for the Behavioral Sciences.* 5th ed. Boston: Houghton Mifflin; [Google Scholar] , Malawi Med 2012 Sep:24(3): 69-71

For the test and retest, 50 primary school teachers were administered the assessment scale for the test, and with an interval of 15 days, the scale was administered again for retesting to check the consistency of the responses. The results were tabulated and Pearson Correlation Coefficient test was conducted. The results showed the 'r' value indicates that there exists a high positive correlation between the test and retest (r= .703, p=.000) (Table XXXII).

Table XXXII

Pearson's correlation coefficient analysis of test and retest reliability

		Test	Retest
Test	Pearson Correlation (r)	1	.703**
	Sig. (2-tailed) (p)		.000
	N	50	50
Retest	Pearson Correlation	.703**	1
	Sig. (2-tailed) (p)	.000	
	N	50	50
**. Correlation is significant at the 0.01 level (2-tailed).			

***c*. Inter-Rater Reliability Test**

Inter-rater reliability (also called by various similar names, such as inter-rater agreement, inter-rater concordance, inter-observer reliability, inter-coder reliability, and so on) is the degree of agreement among independent observers who rate, code or assess the same phenomenon. Interrater reliability describes how closely two or more people agree. International Encyclopedia of Education (2010).

The consistency of subjective judgments made by different raters or evaluators is measured by inter-rater reliability. It addresses whether the rating method is consistent. A high level of inter-rater reliability means that the ratings given by different raters for the same object are consistent. Low dependability, on the other hand, denotes inconsistency.

The procedures involved in IRR validity are detailed step-by-step in the following five stages.

1. Preparation of IRR agreement form
2. Selection of expert panel
3. Distribution and collection of the agreement form
4. Review of received form and compilation of responses
5. Percentage calculation

Stage 1: Preparation of IRR agreement form

Preparing the IRR agreement form includes drafting a cover letter and a response sheet. The cover letter aids panellists in comprehending their responsibilities for the assignment and the author's expectations. It should contain the author's name and address, an introduction, the project title, the project's purpose, and instructions to be followed. Meanwhile, the response sheet should feature rating criteria and a detailed rating scale. This scale assesses aspects such as feasibility, adaptability, clarity, and relevance, providing a consistent standard for evaluation. Specific criteria, like clarity and relevance, ensure each item is judged accurately.

Stage 2: Selection of expert panel

Unlike content validity, there are no specific guidelines for selecting panellists for face validity. (Lawshe, 1975). However, experts with experience in the relevant topic, subject, or work should be chosen to conduct the evaluation. Including more experts can provide a broader range of opinions, but the logistical feasibility must also be considered. Based on experience, the author suggests that 5- 6 experts can provide sufficient and valuable recommendations. Including the names of the experts in the report is subjective and depends on the experts' permission and the guidelines of the report-accepting authority. In this study, nine experts were engaged who provided agreement validity assessments for the assessment scale. These experts comprised a pediatric doctor, a Professor in Human Development, a Professor of special education, a special educator, a remedial educator, and a psychologist.

Stage 3: Distribution and collection of the Agreement form

Responses to the validation form can be collected either face-to-face (through meetings or interviews) or non-face-to-face (via email or postal mail). Despite all details being provided in the cover letter, it is recommended to briefly explain the process when making the request, emphasising the importance of qualitative input to add, delete, or modify any questions, as this will help improve the clarity of the questionnaire. Typically, ten days are sufficient for responses. If no response is received, a gentle follow-up is advised. The face-to-face method is more expensive and time-consuming but tends to yield a higher response rate. Conversely, the non-face-to-face method is cheaper and more convenient but generally has a lower response rate. In our study, we communicated with the experts via email, sending the cover letter and agreement form. Prior to this, telephonic conversations were conducted with each expert to provide detailed information about the agreement form.

Stage 4: Review of received form and compilation of responses

Upon receiving the form, it will undergo a completeness check. If any information is found to be missing, the form may be returned to request the necessary details. Once all completed forms are gathered, responses will be compiled into a result table.

Stage 5: Percentage calculation

Lynn Mary (1986) and Zamanzadeh et al (2015) stated that Face validity involves a non-statistical assessment, meaning that quantitative methods are not used to calculate face validity. When other quantitative validity methods are not feasible due to time constraints, the type of research, the kind of questionnaire, or limited resources, face validity becomes an important method to confirm the overall validity of a research tool. The authors outline that their experience-based process can help determine the level of agreement among raters regarding face validity. However, it is important to note that face validity is an unquantified method and should only be used when other methods are unsuitable or followed by appropriate quantitative validity methods. If additional questions are needed, they should be assessed during face validity. Sharad Desai and Nilesh Patel (2020) recommend using a percentage approach for assessing rater agreement in face validity due to limitations in other methods. Cohen's Kappa Index (CKI) requires only two independent raters with consistent criteria, which doesn't suit the suggested method involving 9 raters for comprehensive feedback. Fleiss' kappa allows for multiple raters but necessitates different groups rating each item, increasing logistical complexity and inconsistency in observation criteria. Thus, the percentage approach is deemed more suitable. Hence, in this study, the method adopted for Evaluating Inter-Rater Reliability is Percentage Agreement for Multiple Raters. The percentage for individual questions and overall agreement will be computed using equations No. 1 and 2, respectively.

The IRR of the current study was obtained using the following equations and methods. According to Sharad Desai and Nilesh Patel (2020) Equation No.: 1 and 2 are applied to the obtained data.

Equation No.: 1

$$\frac{\text{No. of agreed raters per question}}{\text{Total number of raters per question}} \text{ X } 100\%$$

Table XXXIII

Details of equation No.1 percentage of agreement

Question No.	No. of agreed raters per question	Total number of raters per question
Q1	5	9
Q2	6	9
Q3	7	9
Q4	7	9
Q5	5	9
Q6	7	9
Q7	6	9
Q8	7	9
Q9	7	9
Q10	9	9
Total	66	

No. of agreed raters per question (across a total of 10 questions): 5, 6, 7, 7. 5, 7, 6, 7, 7, 9 constituting a total of 66

According to the Equation No. 1, 66 / 90 X 100% = 73.33% of agreement
The obtained Inter-Rater agreement is 73.33%

Equation No.: 2

$$\frac{\text{Sum of \% of all questions}}{\text{Total number of questions}}$$

Table XXXIV

Details of equation No.2 percentage of agreement

Question No.	No. of agreed raters per question	Percentage of all questions
Q1	5	55.55
Q2	6	66.66
Q3	7	77.77
Q4	7	77.77
Q5	5	55.55
Q6	7	77.77
Q7	6	66.66
Q8	7	77.77
Q9	7	77.77
Q10	9	99.99
Total		733.26

According to the Equation No. 2, 733.26 /10 = 73.3%

Table XXXV

Interpretation of percentage of inter-rater agreement (IRA) (LeBreton and Senter 2008)

Level of agreement	% of Reliability
None	0-4%
Minimal	4-15%
Weak	15-35%
Moderate	35-63%
Strong	64-81%
Almost perfect	82-100%

Source: Mary L. McHugh 2012.Interrater reliability: the Kappa statistics. Biochem Med (Zagreb) 22(3): 276-282.

The results of equation one indicated that the IRR of the current study was obtained to be 73.33% which was found to be in strong percentage of reliability.

***d*. Sensitivity and Specificity analysis**

To find the accuracy of the assessment scale sensitivity and specificity analysis was carried out. Assessment tools, the Verbal Learning Disability and Non-Verbal Learning Test developed by Dr Vishal Sood in 2012 were concurrently employed to determine the sensitivity and specificity of the assessment scale. The sensitivity indicates the proportion of correct responses identified as disability groups in both tests. Specificity indicates that the proportion of correct responses was identified as atypical children with no symptoms of LD group in both tests. A positive likelihood ratio represents the possibility that the person with the disability will be tested as a disability. A negative likelihood ratio represents the possibility that the atypical children with no symptoms of LD person tests as disabled.

To obtain the Sensitivity and Specificity of the developed Assessment Scale, 166 primary-class children were assessed for Learning Disability with the developed Assessment Scale and two tools namely Verbal Learning Disability and Non- Verbal Learning Test. The results are shown in Tables XXXVI and XXXVII.

Table XXXVI

Cross-tabulation between groups and assessment scale.

AS	Groups		
	LD	Atypical children with no symptoms of LD	Totals
LD	94 (91.3%)	2 (3.2%)	96
Normal	9 (8.7%)	61 (96.8%)	70
Totals	103	63	166

Table XXXVII

Summary of sensitivity and specificity analysis.

Sl. No.	Terms	Formulae	Values
1	Sensitivity	TP/(TP+FN)	91.26%
2	Specificity	TN/(FP+TN)	96.83%
3	Positive Likelihood Ratio	Sensitivity/(1-specificity)	28.75
4	Negative Likelihood Ratio	(1-Sensitivity)/Specificity	0.09024
5	Accuracy	(TP+TN)/(TP+TN+FP+FN)	93.37%

TP: True Positive, TN: True Negative, FP: False Positive, FN: False Negative

In Table XXXVI we can see that 91.3% of persons were identified as LD in both the tests and the remaining 8.7% were identified as LD to atypical children with no symptoms of LD, that is sensitivity was 91.26% as tabulated in the summary table XXXVII. 96.8% of persons were identified as normal in both the tests and the remaining 3.2% were atypical children with no symptoms of LD to LD, i.e., a specificity of 96.83% was obtained as tabulated in Table XXXVII. The Accuracy of the assessment scale was 93.4% which indicated the assessment scale can be used for identifying learning disability. Also, the Kappa coefficient of agreement was obtained as 0.862 which indicated almost perfect agreement and it was statistically significant ($p<0.05$).

Thereby the stated hypothesis H_a2, “the developed Assessment Scale has sufficient validity and reliability” was accepted

B. Development of norms of the standardised assessment scale and administration

The development of norms involves calculating standardised scores using Z-scores and percentile ranks. The Z-score is a statistical measure that indicates how a value compares to the mean, expressed in standard deviations. This allows for comparisons across different distributions and determines the likelihood of a score within a normal distribution.

Z-scores were calculated for the raw data, such as a raw score of 70 yielding a Z-score of -1.55. These scores help categorize learning disabilities into five quartile ranks: normal, mild, moderate, severe, and profound. This classification provides class intervals for assessing levels of learning disability both overall and component-wise.

Once the scoring is done as per the methodology, the obtained total score is compared with the Z-score and raw score to determine the level of learning disability. This approach helps identify maximum and minimum Z-scores and raw scores, making the tool handy and user-friendly for identifying learning disabilities.

Table XXXVIII

Raw score and Z score of assessment scale

Raw Score	Z score	Raw Score	Z score	Raw Score	Z score	Raw Score	Z score
48	-2.07	100	-0.85	138	0.05	182	1.08
49	-2.05	101	-0.83	139	0.07	183	1.11
52	-1.98	102	-0.80	140	0.09	184	1.13
54	-1.93	103	-0.78	141	0.12	185	1.15
66	-1.65	104	-0.75	142	0.14	186	1.18
67	-1.63	105	-0.73	143	0.16	187	1.20
69	-1.58	106	-0.71	145	0.21	188	1.23
70	-1.56	107	-0.68	146	0.24	189	1.25
71	-1.53	108	-0.66	147	0.26	190	1.27
72	-1.51	109	-0.64	148	0.28	191	1.30
73	-1.49	110	-0.61	149	0.31	193	1.34
74	-1.46	111	-0.59	150	0.33	194	1.37
75	-1.44	112	-0.57	151	0.35	195	1.39
76	-1.42	113	-0.54	153	0.40	196	1.41

Raw Score	Z score	Raw Score	Z score	Raw Score	Z score	Raw Score	Z score
77	-1.39	114	-0.52	154	0.42	197	1.44
78	-1.38	115	-0.50	156	0.47	198	1.46
79	-1.34	116	-0.47	158	0.52	199	1.49
80	-1.32	117	-0.45	159	0.54	201	1.53
81	-1.30	119	-0.40	160	0.57	202	1.56
82	-1.27	120	-0.38	161	0.59	203	1.58
83	-1.25	121	-0.35	162	0.61	205	1.63
84	-1.23	122	-0.33	164	0.66	206	1.65
86	-1.18	123	-0.31	165	0.68	207	1.67
87	-1.16	124	-0.28	166	0.71	208	1.70
88	-1.13	125	-0.26	168	0.75	211	1.77
89	-1.11	126	-0.24	169	0.78	212	1.79
90	-1.09	128	-0.19	170	0.80	213	1.82
91	-1.06	129	-0.17	172	0.85	214	1.84
92	-1.04	130	-0.14	173	0.87	216	1.89
93	-1.01	131	-0.12	174	0.90	217	1.91
94	-0.99	132	-0.09	175	0.92	219	1.96
95	-0.97	133	-0.07	176	0.94	224	2.07
96	-0.94	134	-0.05	178	0.99	226	2.12
97	-0.92	135	-0.02	179	1.01	233	2.29
98	-0.90	136	-0.00	180	1.04	234	2.31
99	-0.87	137	0.02	181	1.06	240	2.45

Administration

The standardised assessment scale, incorporating Z-score and raw score interpretation, was administered to primary school teachers with specific instructions. Teachers received printed guidelines in the assessment scale questionnaire to observe students who might exhibit symptoms or characteristics indicating the need for additional support. This input aids in early identification, not only detecting learning disabilities but also pinpointing specific areas where a child may require intervention.

Instructions for teachers while administering/ using the assessment scale:

- There will be some children in your class who may exhibit the given symptoms/characteristics, and you feel that they need extra help. Your information will facilitate early identification and understanding of the child better.

- Keep that particular child in mind and answer the following statements, ensuring the child does not have any visual or hearing problems.
- Go through each statement and use the five-point scale (Always, Very Often, Sometimes, Rarely, Never) to mark the level of the symptom by placing a (✓) in the appropriate box based on your observations.
- There is no specific time limit, but ensure all statements are answered.
- All information provided will be treated with strict confidentiality.
- After completing the questionnaire, the marked options are scored from 0 to 5. The total score is then calculated, and with the help of the raw score and Z-score, the teacher can understand the child's level of learning disability or identify if the child is atypical.

This administration process helps maintain the reliability of the results. Utilising these norms and practices makes the assessment scale an effective tool for identifying learning disabilities with ease and accuracy.

C. Knowledge Attitude Practice (KAP) of primary school teachers on learning disability

Socio-demographic markers

Socio-demographic elements, lifestyles, skills, and personality traits mould an individual's knowledge, practices, and attitudes. Socio-demographic profiles, including age, gender, race, socioeconomic status, education, marital status, family structure, religion, language, etc., are utilised for analysing patterns, trends, and disparities within populations. These factors play a crucial role in research, policy-making, and social planning to address specific challenges faced by different groups. Examining socio-demographic markers in human development and behavioural sciences is vital for a comprehensive understanding of the intricate interplay between individual, family, and societal factors influencing growth. This exploration aids in identifying disparities, informing interventions, and fostering a more

equitable and supportive environment for all, as highlighted by Lichtenberg (2010) that sociodemographic traits can impact an individual's capacity to gain knowledge.

A teacher, in essence, is an individual entrusted with the responsibility of facilitating learning and development in children. Educationalists stress that a teacher's role goes beyond the mere transmission of content knowledge. Instead, they see teachers as professionals engaging in various activities to promote student growth, understanding, and critical thinking. A teacher's approach should be characterised by empathy, respect, and inclusivity, recognising the diverse backgrounds, abilities, and challenges each student brings. Creating an educational environment that allows students to acquire firsthand information, with adequate instructor support at each cognitive level, is the primary responsibility of a teacher, as emphasised by Kudryashova et al. in 2015. Teachers' knowledge regarding children's challenges, such as learning disabilities, plays a pivotal role in effectively addressing these challenges within the school setting. Understanding learning disability prevalence rates in India ranging from 2.16% to 30.77% (Joseph and Devu, 2022), and its incurable yet manageable nature, underscores the importance of teachers in providing crucial support.

Exploring the influence of socio-demographic markers on teachers' knowledge, attitudes, and practices regarding learning disabilities is crucial for several reasons. Age emerges as a significant factor, with older teachers potentially exhibiting higher levels of empathy and experience, while younger teachers bring broader perspectives and enthusiasm. Additionally, geographical location, whether rural or urban, influences teachers' exposure to diversity, resources, and support services, impacting their knowledge, attitude, and practices related to learning disabilities. Teachers from joint families may have more exposure to learning disabilities, fostering a deeper understanding through shared experiences and discussions. Extended teaching periods, higher qualifications, and continuous professional development contribute to teachers' enhanced understanding and inclusive learning environments, as affirmed by Podolsky et al. (2019).

Recognising the impact of socio-demographic markers on teachers' knowledge, attitudes, and practices toward learning disabilities is paramount, acknowledging these influences can significantly improve the quality of education and support provided to students with learning disabilities. Targeted interventions and professional development programmes may help enhance teachers' abilities in catering to the diverse needs of children and building a

foundation for inclusive education. Hence, the aim was to illuminate the intricate interplay of social factors that influence participants' knowledge, attitude, and practice under the following headings in this section.

i. Socio-demographic markers of the teachers

ii. Level of Knowledge Attitude and Practice (KAP) among primary school teachers on learning disability

iii. Interaction of KAP and Socio-demographic markers of teachers on LD

i. Socio-demographic markers of the teachers

The socio-demographic distribution table throws light on the intricate interplay of social factors that influence participants' experiences and outcomes in this study.

Table XXXIX

Socio-demographic markers of the respondents

S. No	Socio-demographic markers	Categories	Number	Percentage
1.	Age (in years)	21 -30	137	26.6
		31 – 40	154	30.0
		41 – 50	154	30.0
		51 – 60	69	13.4
2.	Gender	Female	465	90.5
		Male	49	9.5
3.	Marital status	Single	84	16.4
		Married	419	81.5
		Widowed	11	2.1
4.	No of children	0	109	21.2
		1	173	33.7
		2	215	41.8
		3 or more	17	3.3
5.	Family Type	Joint	186	36.2
		Nuclear	328	63.8
6.	Area of Living	Urban	230	44.7
		Rural	149	29.0
		Semi-Urban	135	26.3
7.	Educational Status	Graduation with B.Ed	320	62.3
		Graduation without B.Ed	113	22.0
		Diploma/Teacher training	81	15.7

S. No	Socio-demographic markers	Categories	Number	Percentage
8.	Years of Experience	Less than 5 years	155	30.2
		6-10years	107	20.8
		11-15 years	81	15.8
		More than 15 years	171	33.2
9.	Type of School	Government	136	26.5
		Private	378	73.5
10.	Board of School	State	424	82.5
		CBSC	58	11.3
		ICSE	32	6.2
11.	Working with /without counsellor	Working with counsellor	112	21.8
		Working without counsellor	402	78.2
12.	Child development / Psychology in curriculum	Yes	285	55.4
		No	229	44.6
Total			**514**	**100**

Table XXXIX investigates the socio-demographic markers of teachers. Incorporating age into the socio-demographic markers of the sample is indispensable in research, particularly when studying teachers. Age serves as a critical determinant influencing teachers' career stages, pedagogical approaches, and adaptability to evolving educational practices. Understanding the diverse age distribution among teachers allows for a nuanced exploration of their responses to learning disabilities and engagement with professional development opportunities. Younger teachers may exhibit openness to innovative teaching methods, while older teachers contribute valuable experience but may show resistance to change. Additionally, age diversity influences classroom dynamics, school culture, and the potential need for targeted interventions tailored to the specific challenges faced by teachers at different career stages. Overall, acknowledging age as a demographic factor enhances the contextual understanding of teachers' knowledge, practices, and attitudes, providing valuable insights for the improvement of educational strategies, particularly in addressing learning disabilities. From table XXXIX the age distribution reveals a balanced representation across various age groups. Teachers aged 31-50 constitute a significant portion, with 30% each in the 31-40 and 41-50 age groups. A substantial number of younger teachers, aged 21-30, make up 26.6%, while those in the 51-60 age group account for 13.4%.

Exploring the gender distribution among teachers is integral to gaining a nuanced understanding of potential gender-specific challenges and preferences that can significantly impact their knowledge, attitudes, and practices related to learning disabilities. Gender roles and societal expectations can shape individuals' perspectives and approaches to education. Moreover, examining gender-specific challenges can shed light on disparities in professional development opportunities or career advancement. Additionally, preferences in teaching methods or communication styles may vary between genders, influencing how teachers approach students with LDs. The gender composition of the study reflects predominantly female teachers at 90.5%, while males represent 9.5% of the sample. A similar study by Alyaha and Mbogo (2017) states that men are apprehensive about teaching as a career. This indicates why male teachers are less in the teaching profession. As per India Today Web Desk (May 2023) Data from the Education Department say that gender imbalance is most evident in elementary and middle schools, where more than two-thirds of teachers are women.

Investigating teachers' marital status within the socio-demographic profile is essential for comprehending potential influences on their knowledge, attitudes, and practices concerning learning disabilities. Marital status serves as a critical factor that can shape teachers' availability, support structures, and personal commitments, consequently influencing their interactions with students encountering learning challenges. In this study. marital status highlights that the majority of teachers are married (81.5%), with a smaller percentage being single (16.4%) and a very small portion being widowed (2.1%). Recognising the multifaceted implications of marital status enables a more nuanced understanding of teachers' knowledge, attitudes, and practices concerning learning disabilities.

As family serves as the immediate environment for teachers, the type of family they originate from is likely to impact their knowledge, attitude, and practice. Teachers living in joint families can be exposed to many challenges because they engage with a wider family network. By having a chance to talk about and exchange experiences linked to challenges and also LD, this exposure can promote a deeper knowledge of the condition. In the context of a combined family may include discussing difficulties, asking for guidance, and learning from family members who may have experienced LD in their personal or professional life. This distinction may influence a teacher's approach to students and their understanding of family

dynamics. The data indicates that 63.8% of teachers come from nuclear families, while 36.2% belong to joint families.

The residential environment, encompassing urban, rural, or semi-urban settings, is often associated with the diversity of the teacher population. Urban areas typically exhibit greater cultural, linguistic, and socioeconomic diversity compared to rural counterparts. Teachers in urban settings are likely to have access to a wider array of professional development opportunities and networking events, providing platforms to learn from experts and exchange knowledge and best practices related to learning disabilities. In this study, the distribution of samples based on the area of residence revealed that 44.7% resided in urban areas, followed by 29% in rural areas, and 26.3% in semi-urban areas. The educational qualifications of teachers play a pivotal role in comprehending and addressing the needs of children with LDs, as it can significantly influence a teacher's ability to assess and provide individualised support to students. In the current investigation, a substantial majority (62.3%) held a graduation with a B.Ed, 22% possessed a graduation without B.Ed and the remaining 15.7% had a diploma or teacher training.

Experience equips teachers with a profound understanding, adaptability, and flexibility in catering to the diverse needs of students. Acknowledging the significance of experience, teachers were examined based on their years of teaching. Approximately 33.2% of teachers had more than 15 years of teaching experience, while 30.2% had less than 5 years of experience, followed by 20.8% with 6-10 years of experience, and 15.8% with 11-15 years of experience. Experience levels likely impact a teacher's adaptability and understanding of students' needs.

The type of the school where a teacher is employed also plays a pivotal role in shaping their knowledge and practices. Government schools ensure that teachers possess the necessary qualifications and certifications, while private schools, with their abundance of resources and smaller class sizes, enable teachers to engage with students more effectively. This diverse professional environment may influence a teacher's knowledge and practices. The study encompassed nearly 73.5% of teachers working in private schools, with the remaining teachers employed in government schools.

The curriculum framework serves as a foundational structure guiding educational practices, encompassing the content, skills, and methods employed in teaching. It significantly influences teaching approaches, methodologies, and the overall learning

experience for both teachers and students. A well-designed curriculum framework provides a roadmap for educators, ensuring alignment with educational objectives and standards, and may impact the choice of instructional materials, assessment methods, and the overall classroom environment. In the context of the study, the distribution of teachers across different educational boards further highlights the relevance of curriculum frameworks. The majority of teachers, constituting 82.5%, handle classes under the state board, indicating a significant adherence to the curriculum established by the respective state education authorities. Additionally, 11.3% of teachers are involved in teaching under the Central Board of Secondary Education (CBSE), and 6.2% are associated with the Indian Certificate of Secondary Education (ICSE). This diverse distribution suggests varying curriculum frameworks, each with its unique emphasis and guidelines, potentially shaping the teaching methods and approaches employed by teachers in the study.

The counsellors, being well-informed about learning disabilities, can provide teachers with valuable insights, resources, and guidance in addressing the diverse needs of students with learning challenges. Collaborating with counsellors has the potential to enhance teachers' knowledge of effective teaching strategies, foster a more positive attitude towards inclusive education, and shape their classroom practices for better support. The exchange of ideas and expertise with counsellors contributes to a more comprehensive and empathetic approach in the educational context. Ferlazzo (2014) in his article “Response: A teacher-Counsellor partnership is ‘Essential’ for students success” states the importance of teachers and counsellors working together to maximise their impact on students' achievement, indicates the need of whether a teacher is working with a counsellor or without a counsellor. In this study, 21.8% of teachers collaborate with a counsellor, while the majority (78.2%) do not. Consequently, investigating the influence of counsellor presence becomes crucial to understanding how such collaborations impact teachers' KAP related to LD.

Understanding that some teachers had the course on child development/psychology in their curriculum becomes important to study the influence of it on the level of Knowledge, Attitude, and Practices (KAP) regarding LD among teachers. This factor may significantly impact a teacher's understanding of students' cognitive and emotional needs, and exploring its influence is crucial for designing targeted interventions that align with the diverse educational backgrounds of teachers. A notable majority, accounting for 55.4% of teachers, incorporate child development/psychology into their curriculum. Conversely, 44.6% of teachers do not

have this component in their curriculum. This distribution underscores the significance of studying how exposure to child development/psychology may shape a teacher's comprehension of students' needs, influencing their KAP, particularly in addressing the cognitive and emotional aspects of learning challenges.

ii. Level of Knowledge Attitude and Practice (KAP) among primary school teachers on learning disability

For the early identification and effective management of LD among students, teachers play a pivotal role. Knowledge, attitude, and practice (KAP) are crucial factors influencing teachers' abilities to recognise, accommodate, and support students with LD. Knowledge entails understanding the characteristics, causes, and intervention strategies for LD. Attitude reflects teachers' beliefs, perceptions, and emotional responses toward students with LD, which can impact their willingness to accommodate and support these students. Practice encompasses the implementation of effective teaching strategies, classroom management techniques, and individualised support for students with LD. By assessing the levels of KAP among teachers, valuable insights are gained into their preparedness and efficacy in addressing LD.

Table XL

Level of KAP among primary school teachers on learning disability

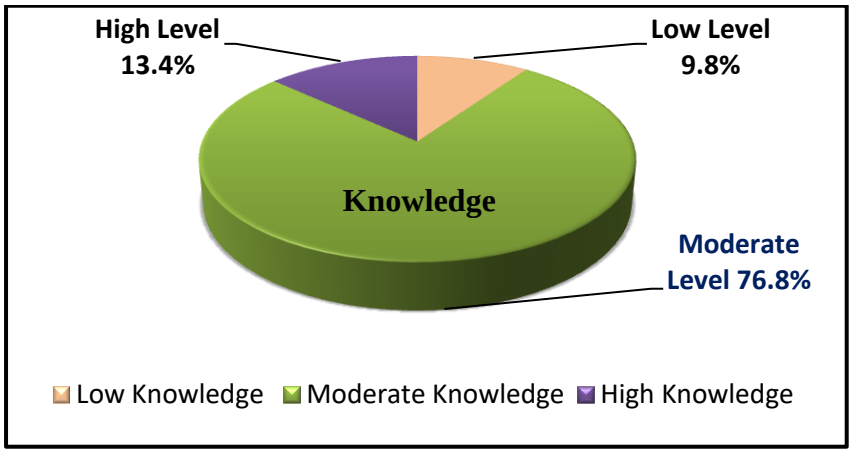
S.No	Variables	Categories	Number	Percentage
1	Knowledge	Low	50	9.8
		Moderate	395	76.8
		High	68	13.4
2	Attitude	Unfavourable	31	6.0
		Neutral	310	60.3
		Favourable	173	33.7
3	Practice	Poor / Unsatisfactory	17	3.3
		Average	296	57.6
		Good / Satisfactory	201	39.1
		Total	**514**	**100**

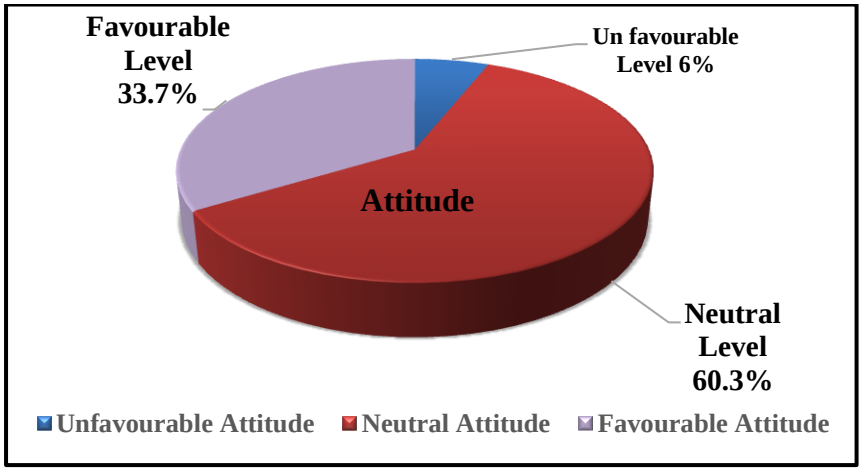
Understanding the relationship between knowledge, attitude, and practice allows for targeted interventions and professional development initiatives aimed at enhancing teachers' competencies in identifying and supporting students with LD, ultimately facilitating early identification and intervention strategies to optimise learning outcomes for all students. Recognising the importance of KAP on LD, the objective was to assess the KAP of teachers and its interaction.

Table no XL illustrates the levels of KAP among PRTs towards LDs. Among 514 primary school teachers, in knowledge, a notable 9.8% exhibit a low level, while 76.8% maintain a moderate understanding, and 13.4% possess a high level of knowledge about LD. Examining attitudes, 6.0% hold an unfavourable perspective, 60.3% maintain a neutral stance, and 33.7% express a favourable attitude. Concerning classroom teaching practices, 3.3% demonstrate poor or unsatisfactory methods, 57.6% exhibit average practices, and 39.1% showcase good or satisfactory approaches concerning learning disabilities.

The data indicates that only 13.4% possess a high level of knowledge regarding learning disabilities. This suggests that a smaller segment of teachers are exceptionally well-versed in understanding and addressing the complexities associated with learning disabilities. Meanwhile, the majority, constituting 76.8%, falls within the moderate knowledge category. While this might be perceived as a satisfactory level, it's crucial to note that a moderate understanding may still indicate a potential lack of in-depth knowledge required to effectively identify and support students with learning disabilities. Additionally, 9.7% with a low knowledge level is a cause for concern, as it signifies a limited proportion of educators who may not be adequately equipped to recognise and cater to the needs of students with learning disabilities. Examining attitudes, a small fraction, accounting for 6.0%, hold an unfavourable perspective, while a majority, constituting 60.3%, maintain a neutral stance. In contrast, a significant portion, amounting to 33.7%, expressed a favourable attitude towards learning disabilities. This distribution provides insights into the varied perspectives held by teachers, emphasising the need to understand and address any unfavourable attitudes that may hinder the effective support and inclusion of students with LDs.

Level of Knowledge Attitude Practice (KAP) among primary school teachers on learning disability





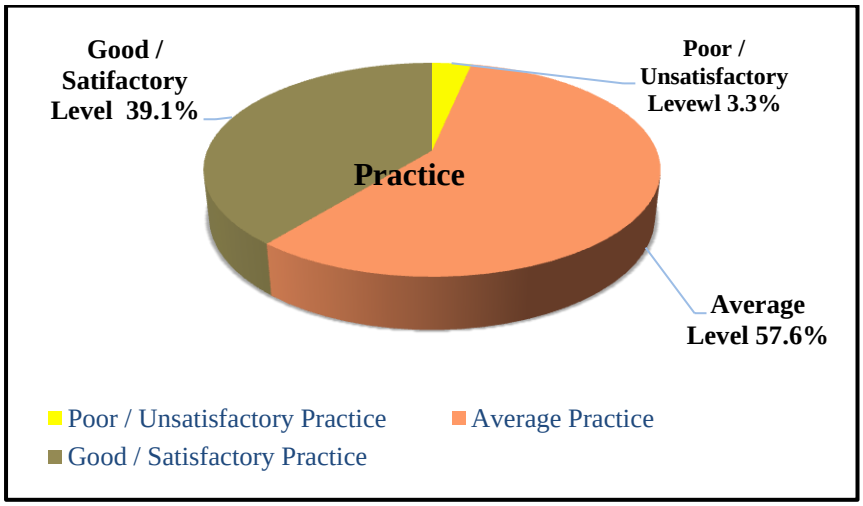


Figure 8

In classroom teaching practices, a minimal percentage, specifically 3.3%, demonstrated poor or unsatisfactory methods. The majority, constituting 57.6%, exhibited average practices, while a substantial portion, amounting to 39.1%, showcased good or satisfactory approaches concerning learning disabilities. This distribution highlights the range of teaching practices, emphasising the need to address both average and low levels of performance. While a majority exhibit average practices. Practices, is important to recognise that any instances of poor or unsatisfactory methods warrant attention and improvement. Ensuring that both average and low levels are addressed is crucial for enhancing the overall effectiveness of supporting students with learning disabilities. Several research studies conducted in diverse locations have yielded varying results. Specifically, a study led by Shari and Vranda in 2015, revealed that only 5% of the teachers showed adequate knowledge about LD. Similarly study conducted by Gandhimathi and Ejio (2010) revealed that a very low percentage of PRTs showed adequate knowledge of LD. In a 2019 study, Ali et al. discovered that although the majority of teachers possessed some knowledge regarding the consequences and interventions for LDs, their knowledge of the concepts and causes of these conditions is woefully inadequate for their practical implementation in the classroom. According to the results of the study by Madhamani and Joseph in 2021, a significant portion of teachers lack the essential knowledge and awareness required to tailor instruction for students facing learning difficulties. In a recent study, Dani et al. (2024) found that school teachers initially had limited knowledge about learning disabilities (LD). However, their understanding of LD, its specific areas, and screening methods significantly improved following the intervention. This highlighted the importance of training primary and post-primary school teachers on LD and the services available for affected children. Shari and Vranda (2016) Teachers' attitudes towards including students with learning difficulties in mainstream classrooms were less favourable. The attitudes of female teachers towards supporting students with learning difficulties were positive. The study's conclusions emphasise the necessity of raising awareness to alter the attitude of inclusion and integrating kids with learning challenges into regular classrooms. Another survey by Neha and Roopa (2020) found a significant difference in attitudes towards learning disabilities between government and private school respondents. Private school respondents scored higher on attitude measures, although both groups exhibited a moderate overall attitude towards LD in children. Regarding the practices, Vincent and Shobha (2020) found that government and private school teachers exhibited low to moderate levels of practice in managing children with LDs in the study on classroom

practices regarding LD. The study identified significant associations between demographic factors such as monthly income, place of residence, and current school experience with handling learning disabilities. Furthermore, significant associations were noted with the teachers' gender, the presence of specialised training in managing LD, and having students with LD in the classroom. Additionally, a significant relationship was observed between schools that offer regular training programmes for teachers on teaching, managing, and raising awareness about LD and the teachers' practice levels.

iii. Interaction of KAP and Socio-demographic markers of teachers on LD

Exploring the interaction of KAP with socio-demographic markers among teachers provides a comprehensive understanding of how individual characteristics may influence the approach toward learning disabilities (LD). Socio-demographic markers such as age, gender, years of teaching experience, educational qualifications, and the type of school can potentially shape the dynamics of teachers' KAP in the context of LD. Unravelling these interactions can uncover nuanced patterns and shed light on the unique challenges or preferences that different groups of teachers may exhibit. Analysing the interplay between socio-demographic markers and KAP contributes to the development of targeted strategies for enhancing teachers' capabilities and fostering a more inclusive learning environment for students with LD. The results of these interactions are detailed in the following tables, providing valuable insights into the nuanced relationships between socio-demographic markers and teachers' KAP regarding LD. The elucidated results are discussed in the following headings.

***a*. Interaction of KAP of teachers on learning disability**

Table XLI

Correlation between KAP of Teachers on LD

KAP		Knowledge	Attitude	Practice
Knowledge	Correlation Coefficient	1.000	.391**	.407**
	Sig. (2-tailed)	.	.000	.000
Attitude	Correlation Coefficient	.391**	1.000	.548**
	Sig. (2-tailed)	.000	.	.000
Practice	Correlation Coefficient	.407**	.548**	1.000
	Sig. (2-tailed)	.000	.000	.
	N	514	514	514

** Correlation is significant at the 0.01 level (2-tailed).

Table XLI displays the correlation coefficients between the KAP of PRTs regarding LD. The correlation between knowledge and attitude was significant ($\rho = .391$, $p < .01$), indicating a positive relationship. Similarly, the correlation between knowledge and practice ($\rho = .407$, $p < .01$) and attitude and practice ($\rho = .548$, $p < .01$) were also significant and positive. The correlation coefficients between knowledge and practice ($\rho = .407$) and between attitude and practice ($\rho = .548$) indicated that the cause and effect of attitude were more on practice than the knowledge. This suggested that the influence of attitude on practices regarding LD among teachers was stronger than that of knowledge. This could be because attitudes often drive behaviour and decision-making processes more directly than mere knowledge. Teachers' attitudes towards LD may shape their approach to teaching and support strategies in the classroom, impacting their actual practices and interactions with students. Additionally, attitudes were often shaped by personal beliefs, values, and experiences, which may drive teachers to actively implement inclusive practices and accommodate the diverse needs of students with LD. As per the KAP theory alterations in human health behaviors occur in a three-step progression involving acquiring pertinent knowledge, cultivating attitudes, and integrating behaviours (or practices) Launiala (2009). Subramanian and Manickaraj (2017) noted a correlation between knowledge, attitudes, and teacher efficacy. Additionally, Haq et al. (2012) determined that sufficient knowledge can foster positive attitudes, leading to good teaching practices. Therefore hypothesis $H_0$3 that stated that "there is no significant interaction between Knowledge Attitude Practice (KAP) of primary school teachers (PRTs) on Learning Disability" was rejected.

***b*. Socio-demographic markers and Knowledge of primary school teachers on Learning Disability**

Exploring the nexus between knowledge levels and socio-demographic markers among primary school teachers unveiled valuable insights into the intricate interplay between individual characteristics and the understanding of learning disabilities (LD). Socio-demographic markers like age, gender, teaching experience, working with counsellor, and child development /psychology in curriculum, contributed to shaping teachers' knowledge levels regarding LD. This examination delved into how diverse demographic backgrounds may impact the depth and breadth of teachers' knowledge of LD, shedding light on the multifaceted factors that influenced their professional insights. The following table XLII*a* illustrates the impact of Socio-demographic markers on the KAP of PRTs regarding LD, providing a detailed overview of these significant associations.

Table XLII *a*

Influence of Socio-demographic markers on teachers' knowledge of learning disability

Socio-demographic markers	Categories	N	Mean Rank	Kruskal Wallis H	Df	Sig. (2-tailed)
Age (in years)	21 -30	137	233.84	26.049	3	.0001**
	31 – 40	154	295.94			
	41 – 50	154	267.33			
	51 – 60	69	196.75			
Marital status	Single	84	204.43	13.229	2	.001**
	Married	419	267.14			
	Widowed	11	295.50			
No of children	0	109	211.00	32.052	3	.0001**
	1	173	269.81			
	2	215	281.94			
	3 or more	17	121.24			
Area of living	Urban	230	250.57	2.311	2	.315^{NS}
	Rural	149	253.18			
	Semi-Urban	135	274.07			
Educational Qualification	Graduation with B.Ed	320	254.12	3.961	2	.138^{NS}
	Graduation without B.Ed	113	280.01			
	Diploma/Teacher training	81	239.47			
Years of Experience	Less than 5 years	155	231.58	10.328	3	.016*
	6-10 years	107	281.00			
	11-15 years	81	284.98			
	More than 15 years	171	253.27			
Board of School	State	424	255.83	13.440	2	.001**
	CBSC	58	223.28			
	ICSE	32	341.70			
Total		**514**				

NS – Not Significant **Significant at 1% level *Significant at 5% level

Table XLII *b*. Pair-wise Comparisons (Dunn-Bonferroni post hoc Test) of Teacher's Knowledge of Learning Disabilities based on selected socio-demographic markers

Socio-demographic markers	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. [a]
Age (in years)	51 – 60 & 21 -30	37.097	21.908	1.693	.090^{NS}	.542^{NS}
	51 – 60 & 41 – 50	70.585	21.499	3.283	.001**	.006**
	51 – 60 & 31 – 40	99.189	21.499	4.614	.000**	.0001**
	21- 30 & 41 – 50	-33.488	17.429	-1.921	.055^{NS}	.328^{NS}
	21 -30 & 31 – 40	-62.092	17.429	-3.562	.000**	.002**
	41 – 50 & 31 – 40	28.604	16.913	1.691	.091^{NS}	.545^{NS}
Marital status	Single & Married	-62.706	17.742	-3.534	.000**	.001**
	Single & Widowed	-91.065	47.586	-1.914	.056^{NS}	0.167^{NS}
	Married & widowed	-28.359	45.330	-.626	.532^{NS}	1.000^{NS}
No of children	3 or more & 0	86.880	39.732	2.187	.029*	.122^{NS}
	3 or more & 1	145.687	38.780	3.757	.000**	.0001**
	3 or more & 2	157.815	38.458	4.104	.000**	.0001**
	0 & 1	-58.808	18.149	-3.240	.001**	.007**
	0 & 2	-70.935	17.450	-4.065	.000**	.000**
	1 & 2	-12.127	15.158	-.800	.424^{NS}	1.000^{NS}
Years of Experience	Less than 5 years- More than 15 years	-21.697	16.459	-1.318	.187^{NS}	1.000^{NS}
	Less than 5 years- 6-10 years	-49.427	18.653	-2.650	.008**	.048*
	Less than 5 years- 11-15 years	-53.398	20.347	-2.624	.009**	.052^{NS}
	More than 15 years- 6-10years	27.730	18.293	1.516	.130 ^{NS}	.777^{NS}
	More than 15 years- 11-15 years	31.700	20.018	1.584	.113 ^{NS}	.680^{NS}
	6-10 years- 11-15 years	-3.971	21.858	-.182	.856 ^{NS}	1.000^{NS}
Board of School	CBSC & State Board	32.551	20.777	1.567	.117^{NS}	.352^{NS}
	CBSC & ICSE	-118.427	32.681	-3.624	.000**	.001**
	State Board & ICSE	-85.876	27.207	-3.156	.002**	.005**

NS – Not Significant **Significant at 1% level *Significant at 5% level
a. Significance values have been adjusted by the Bonferroni correction for multiple tests

To investigate the impact of age, marital status, number of children, residential area, educational qualifications, years of experience, and board of education on teachers' knowledge regarding learning disabilities, the data underwent analysis using the Kruskal-Wallis H test. This non-parametric test was employed when dealing with non-normally distributed data. The Kruskal-Wallis H test facilitated the simultaneous comparison of multiple groups, aiming to identify significant differences among them. For those factors that showed significant differences in the Kruskal-Wallis H test, the adjusted significance levels in post hoc tests were discussed to ensure accurate identification of the different groups. A post hoc test was used only after finding a statistically significant result, and it helped to identify specific groups that differed. The term "post hoc" comes from the Latin for "after the event." Among the many post hoc tests developed, the most commonly used one was the Bonferroni test, which is perhaps the simplest form of post hoc analysis. The Bonferroni test involved a series of t-tests performed on each pair of groups. As the number of groups increased, the number of comparisons grew, inflating the Type I error rate. To avoid this, the Bonferroni test adjusted the significance level alpha by dividing it by the number of comparisons. This adjustment, known as the Bonferroni Correction, ensured that the overall Type I error rate remained controlled. After obtaining the new significance level, independent samples t-tests were run to look for differences between pairs of groups. This method allowed for accurate identification of significant differences while controlling for the increased risk of Type I errors (Foester et al., 2018).

The Kruskal-Wallis H test results of socio-demographic markers are shown in Table XLII*a*. Age was classified into four categories 21–30, 31–40, 41–50 and 51–60 years. Significant differences ($H(3) = 26.049$, $p = .0001^{**}$) were observed between the age groups in the knowledge levels with mean rank scores of 233.84, 295.94, 267.33 and 196.75 respectively which indicated that teachers' age was associated with variations in their knowledge level.

Pairwise analysis Table XLII *b* and Figure 9 confirm this and provide the significance values for the three comparisons. The significance value for the comparison between 51-60 and 41-50 years teachers is .006, between 51-60 and 31-40 years teachers is .000, and between 21-30 and 31-40 age groups is .002. Therefore, we can conclude that teachers aged 51-60 have higher knowledge levels than those aged 41-50 and 31-40. Additionally, teachers aged 31-40 years have higher knowledge levels than those aged 21-30 years.

These results suggested that the knowledge level about LD was higher among older teachers. Older teachers would have encountered diverse student needs, classroom scenarios, and educational challenges, which deepen their understanding and expertise on children.

Pair-wise comparison of age on knowledge of primary school teachers on Learning Disability

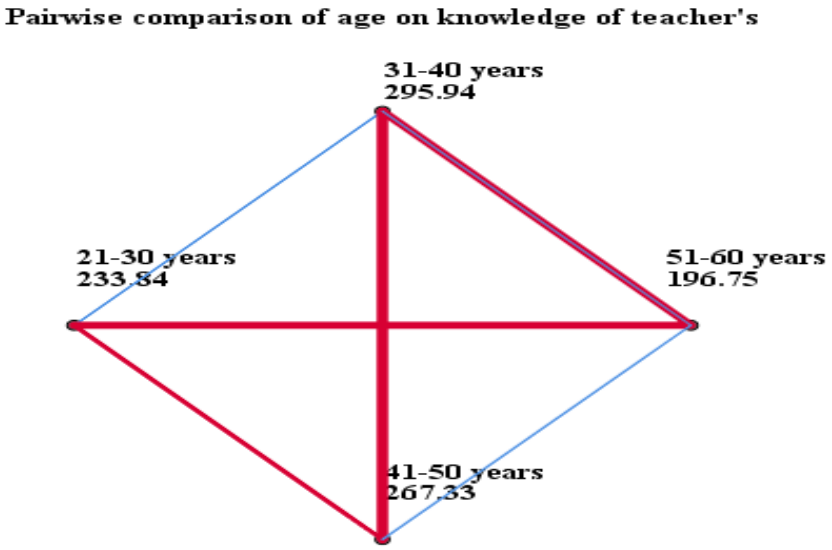


Figure 9

Table XLII*a* displays that marital status was classified into three categories namely single, married, and widowed with the mean scores of 204.43, 267.14, and 295.50 respectively. The Kruskal Wallis H test revealed a statistically significant difference in marital status (H(2) = 13.229, p = .001**) which indicated that teachers' marital status was associated with variations in their knowledge level. In the pairwise comparison analysis (Table XLII *b* and Figure 10) for marital status, it was evident that the married and single groups exhibited a significant difference (Z = -3.534, adj. sig (p) = .001**), which indicated that single individuals tended to differ from those who were married in terms of their family structure. These results implied that married teachers had better knowledge towards LD compared to those who were single and widowed teachers'. These findings underscored the role of marital status as a socio-demographic marker that influences individuals' role in society. It could be assumed that married teachers may have possessed a deeper understanding due to personal experiences within their own families, the support networks available, significant life events of marriage often cultivated personal growth, resilience, and

enhanced problem-solving skills, engaged collaborative discussions with their spouses to seek out specialised professional development opportunities.

Pair-wise comparison of marital status on knowledge of Primary school teachers on Learning Disability

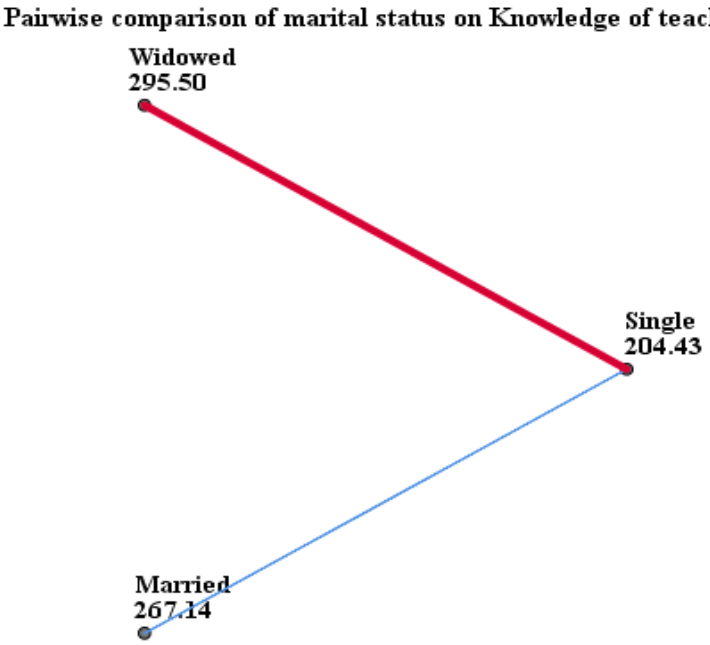


Figure 10

Observing the variable number of children from Table XLII *a*, the Kruskal-Wallis H test showed a significant difference across different categories of no child, one child, two children, and three or more children (H(3) = 32.052, p < .001**). The mean ranks for the categories were 211.00, 269.81, 281.94, and 121.24 respectively. This too implies the importance of counting the number of children an individual has as a socio-demographic marker that plays a significant role in determining the involvement of the individual towards children. The pairwise comparison data inferred from Table XLII*b* and Figure 11 indicated that teachers with three or more children demonstrated significantly higher knowledge compared to those with no children (p = .029NS), one child (adj. sig (p) < .007**), or two children (adj. sig (p) < .0001**). These findings underscored the value of experience living with multiple children for boosting teachers' subsequent knowledge levels. Having three or more children in their families appeared to substantially inform their foundations and strategies related to working with children.

Pair-wise comparison of number of children on knowledge of primary school teachers on Learning Disability

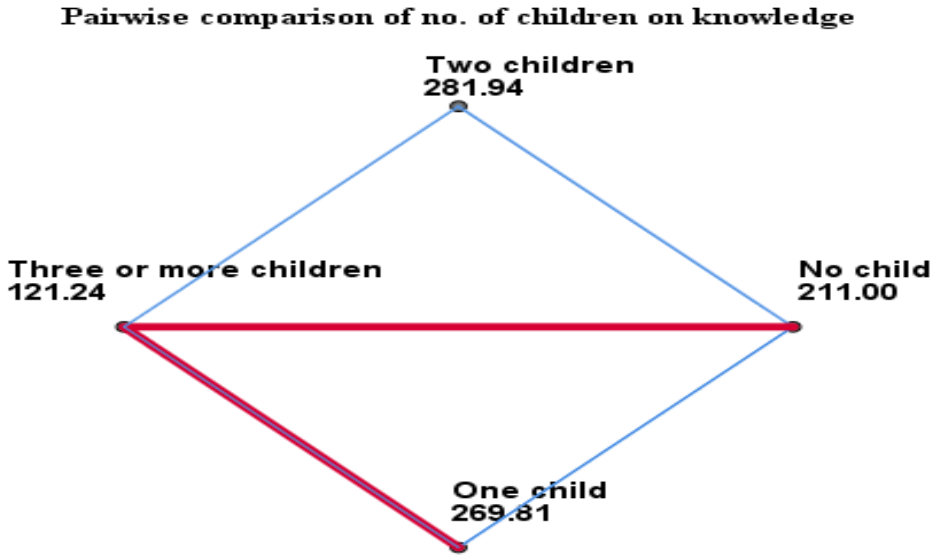


Figure 11

Table XLII*a* shows that the area of living is divided into three distinct categories. The mean ranks for knowledge in these categories were urban (250.57), rural (253.18), and semi-urban (274.07). The Kruskal-Wallis H test indicated no significant difference in knowledge scores across the area of living categories, with H(2) = 2.311, p = .315NS. Similarly, there was no significant difference across various educational qualification categories (H(2) = 3.961, p = .138NS) with teachers who graduated without B.Ed (280.01), with B.Ed (254.12), and a diploma/teacher training (239.47).

Exploring the factor of years of experience, table XLII*a* delineated teachers' distribution across different experience brackets. The mean ranks for each category are as follows, less than 5 years (231.58), 6-10 years (281.00), 11-15 years (284.98), and more than 15 years (253.27). Utilising the Kruskal Wallis H test, a statistically significant difference in knowledge scores emerged among the various experience groups, denoted by H(3) = 10.328 (p = .016*). This implied that years of experience play a role in influencing teachers' knowledge levels related to learning disabilities. Table XLII*b* and Figure 12 present pairwise comparisons of years of experience. While significant differences were observed between teachers with less than 5 years and 6-10 years (adj. sig (p) = .048*). These findings underscore the varying knowledge levels among early-career teachers compared to those with

6-10 years of experience, emphasising the impact of experience on teachers' knowledge of learning disabilities.

Pair-wise comparison of years of experience on knowledge of primary school teachers on Learning Disability

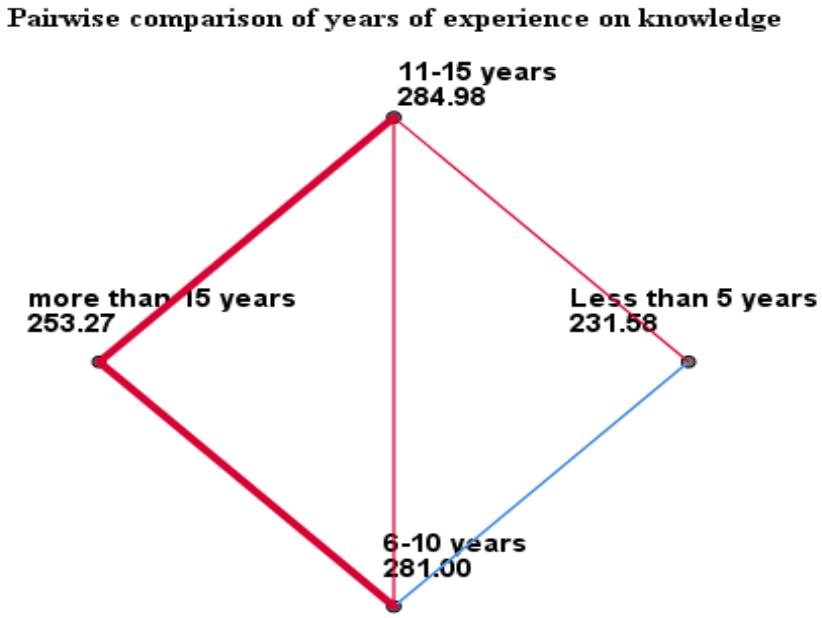


Figure 12

Regarding the board of school from Table XLII*a*, there were significant differences in teachers' knowledge of learning disabilities based on the board of school where they are employed. Results showed a statistically significant difference in knowledge across state, CBSC, and ICSE school types, H(2) = 13.440, p = .001**, with a mean rank knowledge score of 341.70 for ICSE, 255.83 for the state board, and 223.28 for CBSC board. The pairwise comparison data from Table XLII*b* and Figure 13 indicated that teachers working in ICSE board schools demonstrated significantly higher knowledge compared to those in CBSC schools (adj. sig (p) < .001) and state board schools (adj. sig (p) = .005**). The higher knowledge level of teachers in ICSE board schools may be due to the greater exposure through training, directives, resources etc. that equipped them with stronger foundations and strategies related to serving students with learning disabilities. Mehta (2006) found that teachers' knowledge of learning disabilities varied across different educational boards, including SSLC, CBSE, and ICSE. Teachers from the ICSE board demonstrated greater

knowledge of LD compared to those from the CBSE and SSLC boards. The researcher observed that ICSE schools often employed special educators and organised seminars for teachers, likely contributing to the higher knowledge levels among ICSE teachers. Furthermore, the study revealed that ICSE teachers were more successful in identifying students with LD in their classrooms. The regular presence of special educators in ICSE schools enabled ongoing sessions with teachers, which enhanced their understanding and ability to recognise learning disabilities.

Pair-wise comparison of board of school on knowledge of primary school teachers on Learning Disability

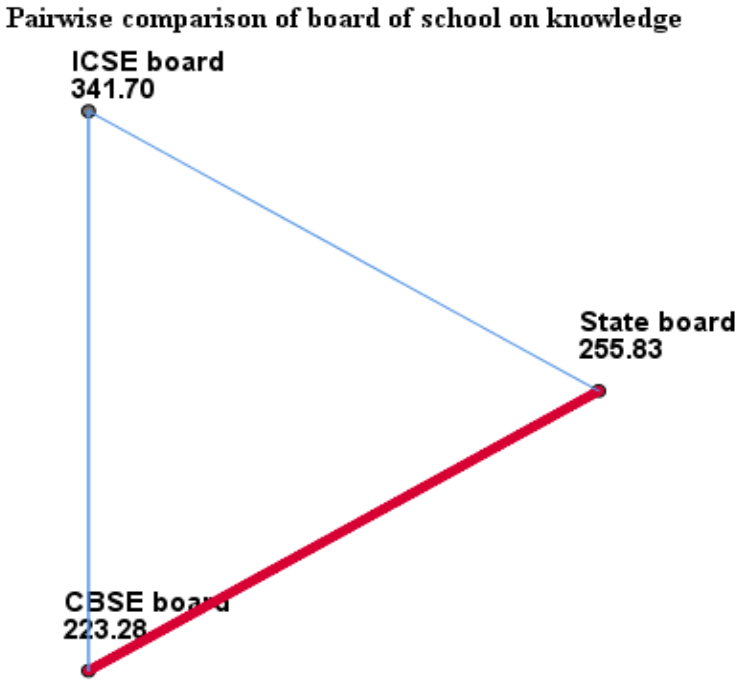


Figure 13

The results from Table XLIIa indicated that age, marital status, no of children, years of experience and board of school had a notable impact on teachers' knowledge scores regarding learning disabilities. In contrast, the area of living and educational qualification did not exert a significant influence on knowledge scores. Shah and Udgaonkar's (2018) findings aligned with this, suggesting a positive correlation between experience, age, and teaching effectiveness. As teachers accumulated more experience and aged, their effectiveness in teaching improved. Similarly, Essa and EI-Zeftawy (2015) discovered a positive connection between age, years of experience, and strategies for supporting students with learning difficulties, implying that with more years in the profession, teachers' knowledge and

understanding of aiding students with learning difficulties increased. These studies underscored the pivotal role of experience and age in enhancing teaching effectiveness and knowledge related to supporting students with learning difficulties among teachers. Similarly, Asok et al., (2020) found an association between the type of school the teachers taught and their knowledge was found to be significant ($p<0.05$).

Conversely, investigations by Arifa and Siraj (2019) yielded contradictory results. Their research revealed no significant relationships between teachers' knowledge and demographic markers such as gender, school type, and educational qualifications concerning dyscalculia. The researchers attributed this to the lack of timely in-service education programmes for school teachers or the limited experience in working with children with learning disabilities. However, teaching experience emerged as the only variable showing a significant relationship. Another study by Dhindsa et al (2021) also found no significant association between the level of knowledge regarding LD and teaching experience. Only 2.86% had good knowledge and there was no significant association between the knowledge of PRTs and their socio-demographic markers like age, gender, marital status, religion, educational qualification, type of school, teaching experience, in-service education on LD, any family member/friend suffering with LDs. Lingeshwaran's study in 2013 similarly concluded that there was no statistically significant association between the level of knowledge among PRTs and their teaching experience. The contradictory findings regarding the relationship between teachers' knowledge of LD and their socio-demographic markers, such as age, gender, and teaching experience, may stem from several factors. The differences in sample sizes, geographic locations, and cultural contexts across the studies could have influenced the outcomes. Studies conducted in different regions or countries might reflect varying educational systems, teacher training programmes, and societal attitudes towards learning disabilities, leading to divergent results. These factors suggested that the relationship between teachers' knowledge and their socio-demographic characteristics is complex and influenced by multiple variables. The divergent outcomes from these studies underscored the importance of exploring the intricate connection between individual factors and teachers' knowledge.

Table XLIII

Differences between selected socio-demographic markers on knowledge of teachers on Learning Disability

Socio-demographic markers	Categories	N	Mean Rank	Mann-Whitney U	Z score	Sig. (2-tailed)
Gender	Male	49	275.68	10501.500	-.902	.367^{NS}
	Female	465	255.58			
Type of school	Government	136	231.25	22134.500	-2.405	.016*
	Private	378	266.94			
Family type	Nuclear	328	247.82	27329.000	-1.964	.050*
	Joint	186	274.57			
Working with counsellor	Yes	112	277.77	20242.000	-1.634	.102^{NS}
	No	402	251.85			
Child development /psychology in curriculum	Yes	285	293.82	22280.000	-6.191	.0001**
	No	229	212.29			
Total		514				
NS – Not Significant **Significant at 1% level *Significant at 5% level						

Differences between type of school on knowledge of primary school teachers on Learning Disability

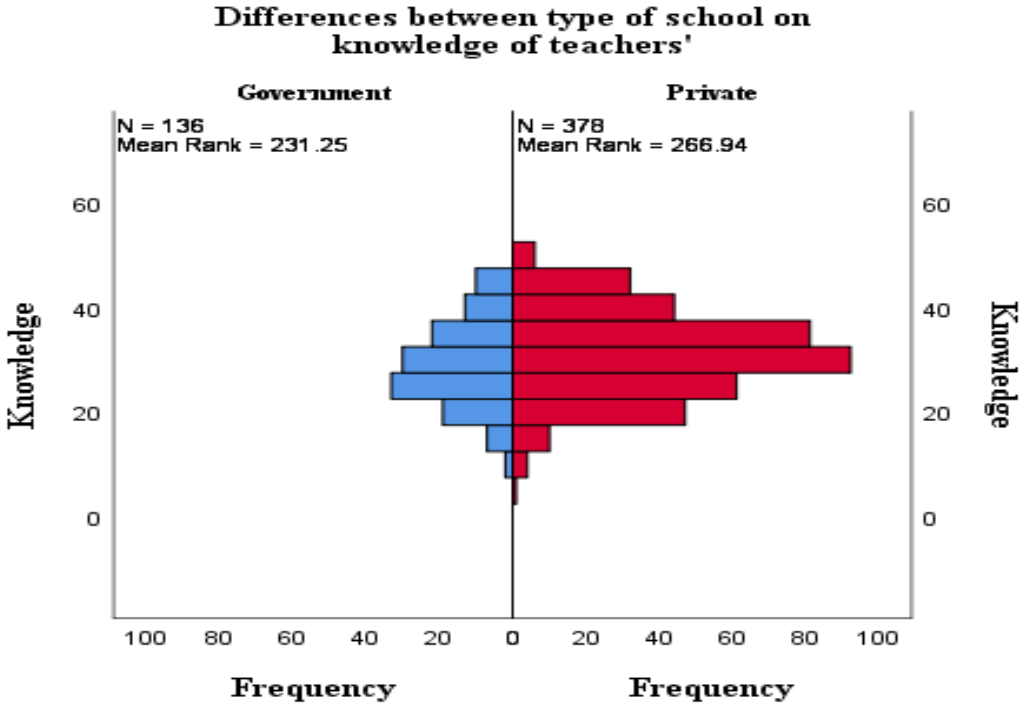


Figure 14

Table XLIII provide the outcomes of the Mann-Whitney U test, investigating the impact of gender, type of school, family type, working with counsellors and child development /psychology in the curriculum on teachers' knowledge concerning learning disabilities. No significant variation emerged between male (275.68) and female educators (255.58), U = 10,501.5, z = -.902, p = .367NS. This suggested gender alone did not directly shape disability conceptualizations. Social processes in teacher development appeared similar for either group. For the "knowledge" variable, the school type was classified as government and private. The analysis revealed a substantial disparity in knowledge between teachers from government schools (231.25) and private schools (266.94), U = 22134.500, Z = -2.405, p = .016*. This (figure 14) indicated that teachers from private schools exhibited a higher mean rank, signifying greater knowledge about learning disabilities compared to their counterparts in government schools. This points to potential gaps in professional development programming across school types that shape disability perspectives. Financial resources and priorities surrounding special needs likely differ between institutions influencing teacher knowledge.

Differences between family type on knowledge of primary school teachers on Learning Disability

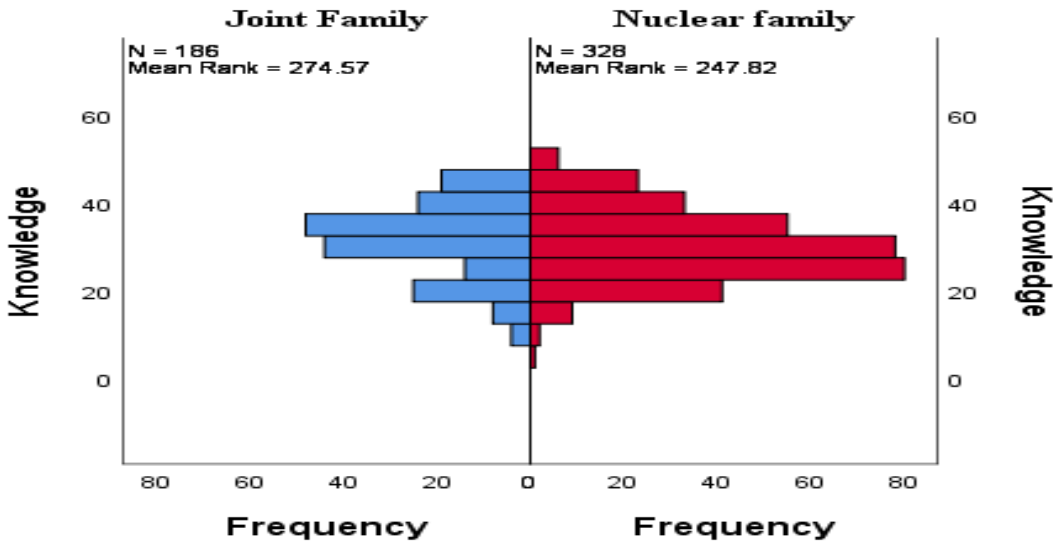


Figure 15

The research by Alahmadi and El Keshky (2019) indicated that the majority of PRTs in Saudi Arabia possessed average knowledge of learning disabilities, with Government school teachers showing a statistically significant higher level of knowledge compared to

Private school teachers. The researcher concludes that academic training on courses on learning disability enhances the teacher's knowledge.

Turning to the influence of family type (figure 15), categorized as nuclear and joint, a marginally significant difference was found for knowledge between teachers from nuclear families (mean rank = 247.82) and joint families (mean rank = 274.57), U = 27329.000, Z = -1.964, p = .050*. This suggests that teachers from joint families may possess higher knowledge about learning disabilities compared to their counterparts from nuclear families. Exposure to multigenerational viewpoints within larger households may enrich conceptualisations of neurodiverse challenges. Higher-density environments promote observational learning about human differences. According to the chapter "Learner in Socio-Cultural Context" in the book *Understanding the Learner* (2024) pg: 7, learners from nuclear families may experience lower learning outcomes. This is because, in nuclear families, learners often face increased responsibilities, such as childcare and domestic duties, which reduce the time available for schoolwork. Additionally, parents in nuclear families have less time to spend with their children and supervise their schoolwork, potentially leading to lower academic performance. In contrast, in joint families, parents have more time to devote to their children, thanks to additional support from other family members. Consequently, learners from joint families may exhibit higher learning performance.

Differences between Child development/psychology in curriculum on knowledge of primary school teachers on Learning Disability

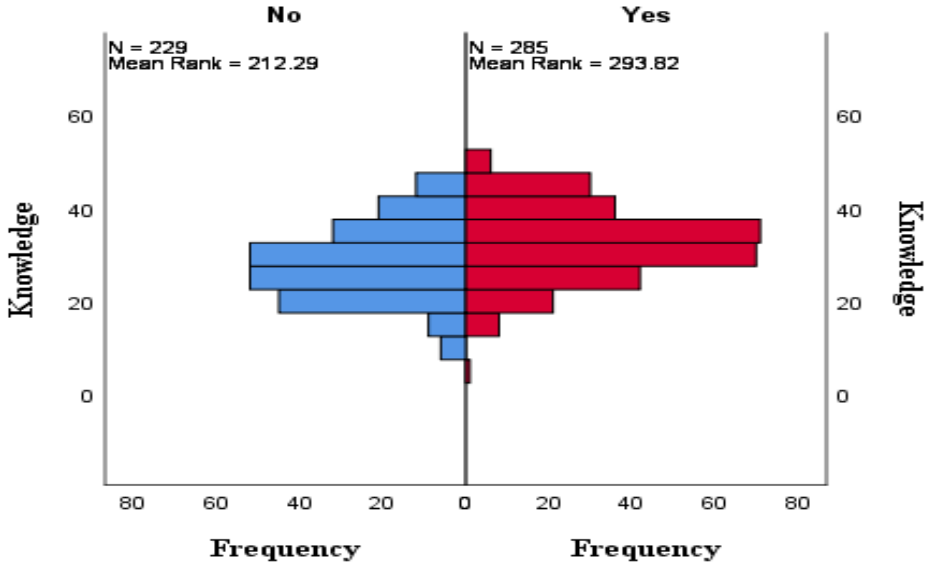


Figure 16

In examining the influence of working with a counsellor, teachers with a counsellor demonstrated a higher mean rank in their knowledge (277.77) compared to their counterparts who did not work with the counsellor (251.85). However, this difference did not achieve statistical significance (U = 20,242.000, Z = -1.634, p = .102NS). Although the presence of a counsellor in the educational setting hinted at a potentially positive impact on knowledge. Conversely (Table XLIII and Figure 16), the inclusion of child development and psychology in the curriculum emerged as a robust factor shaping teachers' knowledge. Teachers whose curriculum embraced these elements exhibited a significantly higher mean rank in their knowledge level (293.82) compared to those without such incorporation (212.29). This difference was highly significant (U = 22,280.000, Z = -6.191, p = .0001**), emphasising the substantial positive influence of integrating child development and psychology into the curriculum of teachers' training on teachers' knowledge of LD. These findings underscored the importance of curriculum design and content in fostering enriched knowledge among teachers regarding learning disabilities.

Thus hypothesis $H_0$4, which stated that "there will be no influence of socio demographic markers on the knowledge of PRTs on LD was rejected for age, marital status, no of children, family type, years of experience, type of school, board of school, child development/Psychology in the curriculum and accepted for gender, area of living, educational qualification, or working with /without counsellor.

b. Socio-demographic markers and attitude of primary school teachers on Learning Disability

Exploring attitudes and socio-demographic markers among PRTs in the context of LD is a pivotal endeavour, shedding light on the complex interplay between educators' attitudes and various demographic elements. Understanding how teachers perceive learning disabilities is crucial for creating inclusive educational environments. This examination delves into the intricate relationship between attitudes and socio-demographic markers, encompassing aspects such as age, marital status, number of children, area of living, educational qualifications, years of experience, and board of school. By unravelling the nexus between these variables gain valuable insights into the factors that shape primary school teachers' attitudes toward learning disabilities, contributing to a more informed and targeted approach to inclusive education.

Table XLIV *a*

Influence of selected Socio-demographic markers on primary school teachers' attitude on learning disability

Socio-demographic markers	Categories	N	Mean Rank	Kruskal Wallis H	df	Sig. (2-tailed)
Age (in years)	21 -30	137	231.90	14.708	3	.002**
	31 – 40	154	291.26			
	41 – 50	154	259.54			
	51 – 60	69	228.44			
Marital status	Single	84	222.96	13.937	2	.001**
	Married	419	260.86			
	Widowed	11	393.09			
No of children	0	109	238.95	20.685	3	.0001**
	1	173	247.24			
	2	215	284.60			
	3 or more	17	138.12			
Area of living	Urban	230	254.63	4.388	2	.111^{NS}
	Rural	149	242.57			
	Semi-Urban	135	278.86			
Educational Qualification	Graduation with B.Ed	320	261.44	6.797	2	.033*
	Graduation without B.Ed	113	273.47			
	Diploma/Teacher training	81	219.65			
Years of Experience	Less than 5 years	155	252.45	12.424	3	.006**
	6-10years	107	280.90			
	11-15 years	81	291.56			
	More than 15 years	171	231.31			
Board of School	State	424	251.25	16.368	2	.0001**
	CBSC	58	246.53			
	ICSE	32	360.16			
Total		**514**				

NS – Not Significant **Significant at 1% level *Significant at 5% level

Table XLIV *b*

Pair-wise Comparisons (Dunn-Bonferroni post hoc Test) of teachers' attitudes on Learning Disabilities based on selected socio-demographic markers

Variable	Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. [a]
Age (in years)	51 – 60 & 21 -30	3.459	21.915	.158	.875^{NS}	1.000^{NS}
	51 – 60 & 41 – 50	31.094	21.506	1.446	.148^{NS}	.889^{NS}
	51 – 60 & 31 – 40	62.814	21.506	2.921	.003**	.021*
	21- 30 & 41 – 50	-27.634	17.435	-1.585	.113^{NS}	.678^{NS}
	21 -30 & 31 – 40	-59.355	17.435	-3.404	.001**	.004**
	41 – 50 & 31 – 40	31.721	16.918	1.875	.061^{NS}	.365^{NS}
Marital status	Single & Married	-37.900	17.748	-2.135	.033*	.098^{NS}
	Single & Widowed	-170.127	47.602	-3.574	.000**	.001**
	Married & widowed	-132.227	45.345	-2.916	.004**	.011*
No of children	3 or more & 0	100.836	38.712	2.605	.009**	.055^{NS}
	3 or more & 1	109.119	37.734	2.892	.004**	.023*
	3 or more & 2	146.482	37.403	3.916	.000**	.001**
	0 & 1	-8.283	18.155	-.456	.648^{NS}	1.000
	0 & 2	-45.646	17.456	-2.615	.009**	.054^{NS}
	1 & 2	-37.363	15.163	-2.464	.014*	.082^{NS}
Educational Qualification	Diploma/Teacher training & Graduation with B.Ed	41.786	18.465	2.263	.024*	.071^{NS}
	Diploma/Teacher training & Graduation without B.Ed	53.815	21.613	2.490	.013*	.038*
	Graduation with B.Ed & Graduation without B.Ed	-12.028	16.245	-.740	.459^{NS}	1.000
Years of Experience	More than 15 years & Less than 5 years	21.138	16.464	1.284	.199^{NS}	1.000^{NS}
	More than 15 years & 6-10years	49.590	18.299	2.710	.007**	.040*
	More than 15 years & 11-15 years	60.255	20.024	3.009	.003**	.016*
	Less than 5 years & 6-10years	-28.452	18.659	-1.525	.127^{NS}	.764^{NS}
	Less than 5 years & 11-15 years	-39.117	20.354	-1.922	.055*	.328^{NS}
	6-10years & 11-15 years	-10.665	21.865	-.488	.626^{NS}	1.000^{NS}
Board of School	CBSC & State Board	4.728	20.784	.227	.820^{NS}	1.000^{NS}
	CBSC & ICSE	-113.630	32.691	-3.476	.001**	.002**
	State Board & ICSE	-108.903	27.216	-4.001	.000**	.0001**

NS – Not Significant **Significant at 1% level *Significant at 5% level

a. Significance values have been adjusted by the Bonferroni correction for multiple tests

Pair-wise comparison of age on attitude of primary school teachers on Learning Disability

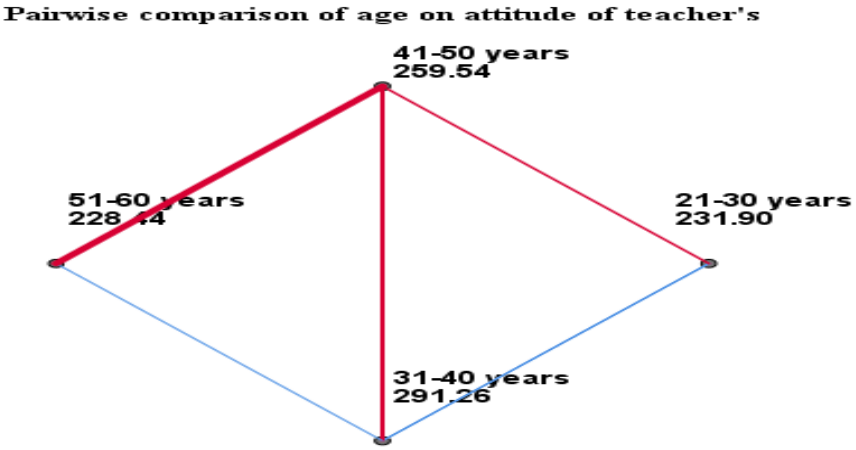


Figure 17

Table XLIV*a* illustrates the results of the Kruskal-Wallis H test, which assessed the effect of socio-demographic markers on PRTs attitudes toward learning disabilities. The mean rank values for the different age groups were: 21-30 years (231.90), 31-40 years (291.26), 41-50 years (259.54), and 51-60 years (228.44). A statistically significant difference in attitude scores was observed across these age groups (H(3) = 14.708, adj. sig (p) = .002**), indicating that teachers' attitudes were influenced by their age. Pairwise analysis in table XLIV*b* and Figure 17 revealed significant variations between certain age categories. Specifically, teachers aged 51-60 demonstrated favourable attitudes compared to those aged 31-40 (adj. sig (p) = .021*). Additionally, a significant difference was found between the 31-40 and 21-30 age groups (adj. sig (p) = .004**) indicating the older age group has a favourable attitude.

Pair-wise comparison of marital status on attitude of primary school teachers on Learning Disability

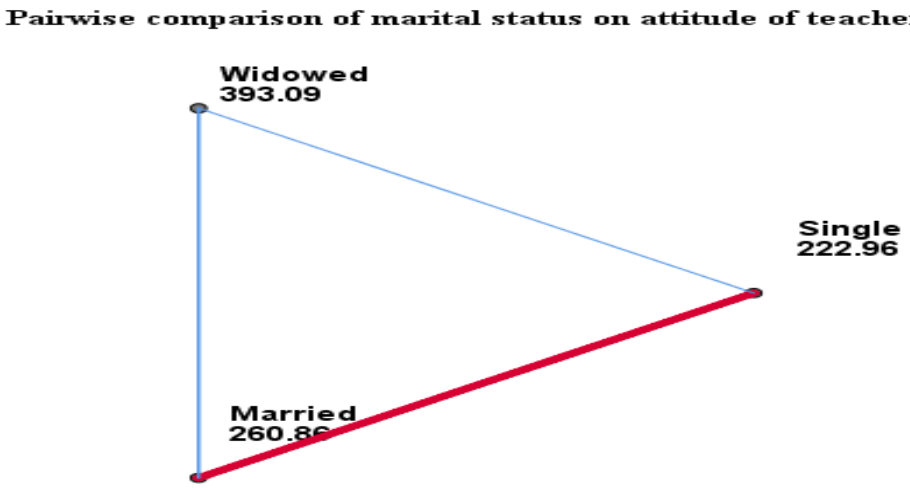


Figure 18

The data on marital status as shown in the table XLIV*a* were classified into single (222.96), married (260.86) and widowed (393.09). A statistically significant difference emerged based on marital status (H(2) = 13.937, p = .001**). The pairwise comparisons table XLIV*b* and Figure 18 revealed that single teachers differed significantly from widowed teachers (p adj. sig (p) < .001**) regarding attitudes. Additionally, a significant difference was observed between married and widowed teachers' (adj. sig (p) = .011*). Thus, marital status appears to be associated with variations in attitudes, with single teachers demonstrating unfavourable attitudes than married or widowed teachers.

Pair-wise comparison of the number of children on attitude of primary school teachers on Learning Disability

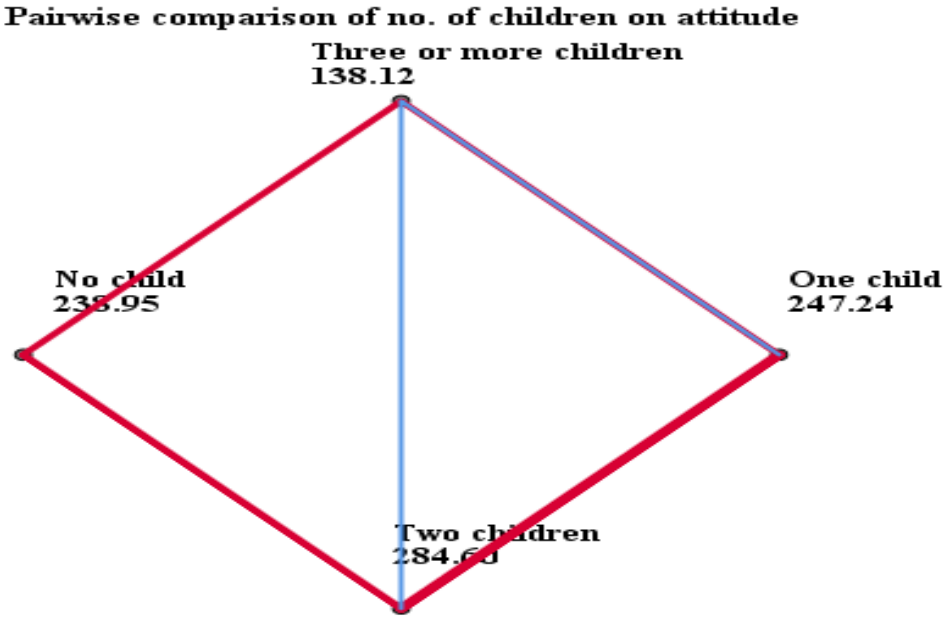


Figure 19

The number of children was segmented into no children (238.95), one child (246.24), two children (284.60) and 3 or more children (138.12) as per table XLIV*a*. A significant difference was found across the groups (H(3) = 20.685, p < .0001**). The pairwise data showed (table XLIV*b* and Figure 19) that teachers with three or more children had significantly favourable attitudes than those with one child (adj. sig (p) = .023*), or two children (adj. sig (p) < .001**). The results indicated that the teachers with more the number of children exhibited favourable attitudes towards learning disability. This underscores the relevance of the number of children in shaping teachers' attitudes towards their students.

Pair-wise comparison of educational qualification on attitude of primary school teachers on Learning Disability

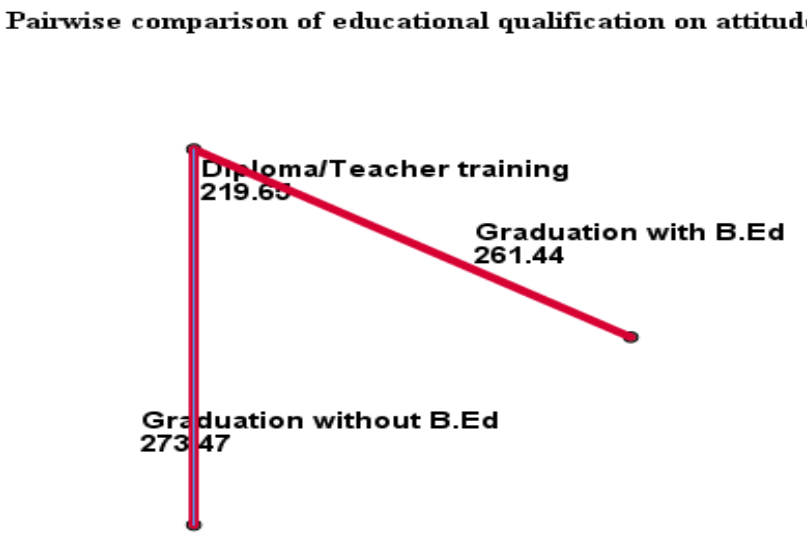


Figure 20

Table XLIV*a* indicated no significant difference emerged in attitude scores across the area of living categories like urban (254.63), rural (242.57) and semi-urban (278.86), denoted by H(2) = 4.388, p = .111NS. However, a significant disparity was observed based on educational qualification (H(2) = 6.797, p = .033*). Concerning pairwise comparison of the educational qualification of teachers from the table XLIV*b* and Figure 20, teachers with a diploma/teacher training qualification showed favourable attitudes compared to those with a graduation without B.Ed (adj. sig (p) = .038*).

Pair-wise comparison of years of experience on attitude of primary school teachers on Learning Disability

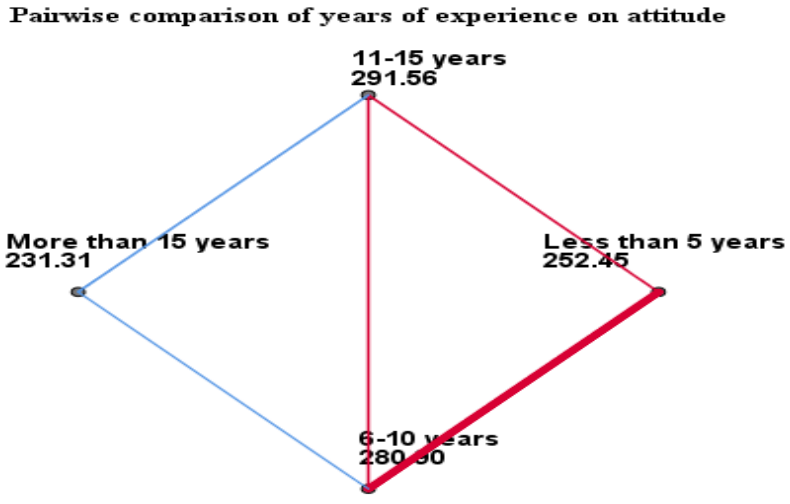


Figure 21

The data from table XLIV*a* on years of experience were categorised into teaching experience less than 5 years (252.45); 6-10 years (280.90), 11-15 years (291.56) and more than 15 years (231.31). A statistically significant difference emerged in attitude scores between the groups (H(3) = 12.424, p = .006**). Pair-wise comparison (table XLIVb and Figure 21) shows that specifically, teachers with over 15 years of experience showed favourable attitudes than those with 6-10 years (adj. sig (p) = .040*) or 11-15 years of experience (adj. sig (p) = .016*). This highlighted the relevance of years of experience in shaping attitudes about learning disabilities and indicated higher the years of experience teachers showed favourable attitudes towards LD.

Pair-wise comparison of board of school on attitude of primary school teachers on Learning Disability

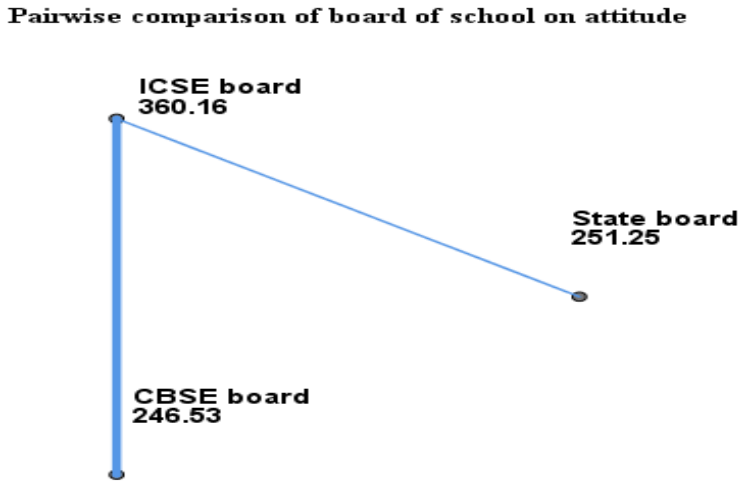


Figure 22

Finally, the data on the school board were classified into state board with a mean rank of 251.25, CBSC with a mean rank of 246.53, and ICSE with a mean rank of 360.16. A significant difference in attitudes emerged across the groups (H(2) = 16.368, p < .001**). The pairwise comparisons (table XLIVb and Figure 22) revealed that ICSE school teachers demonstrated markedly favourable attitudes than State board teachers (p < .001**) as well as CBSC teachers (adj. sig (p) = .002**). The observed disparity in attitudes toward learning disabilities among teachers from the ICSE board, as opposed to CBSE and State board teachers, can be attributed to various factors. One potential factor may be differences in training and professional development programmes, with ICSE teachers potentially benefiting from specific training and resources that enhance their understanding and positive attitude toward students with learning disabilities.

The identified influential factors, including age, marital status, number of children, educational qualification, years of experience, and school board, play a pivotal role in shaping teachers' attitudes towards learning disabilities. Meanwhile, an empirical study by Asok et al. (2021), says that 48.1 per cent of teachers demonstrated insufficient knowledge about learning disabilities, while the majority exhibited positive attitudes toward these challenges. In a separate study, Soni (2020) found that a significant number of teachers lacked adequate knowledge but held highly favourable attitudes toward learning disabilities. Collectively, these studies highlight a consistent trend: many teachers lack in-depth knowledge about the fundamental concepts and causes of learning disabilities. Shari and Vranda (2015) involving 200 on PRTs from 16 schools in Bangalore South revealed a contrasting finding indicating unfavourable attitude among teachers.

Table XLV

Differences between selected socio-demographic markers on attitude of teachers on learning disability.

Socio-demographic markers	Categories	N	Mean Rank	Mann-Whitney U	Z score	Sig. (2-tailed)
Gender	Male	49	255.76	11307.000	-.087	.931^{NS}
	Female	465	257.68			
Type of school	Government	136	234.88	22627.500	-2.072	.038*
	Private	378	265.64			
Family type	Nuclear	328	266.70	27488.000	-1.865	.062^{NS}
	Joint	186	241.28			
Working with counsellor	Yes	112	249.61	21628.000	-.636	.525^{NS}
	No	402	259.70			
Child development /psychology in curriculum	Yes	285	283.29	25282.000	-4.394	.0001**
	No	229	225.40			
Total		514				

NS – Not Significant **Significant at 1% level *Significant at 5% level

Table XLV presents the outcomes of the Mann-Whitney U test, examining the differences between the selected socio-demographic markers on teachers' attitudes towards learning disabilities. For the attitude variable, the analysis categorises personal factors such as gender, type of school, family type, working with a counsellor, and inclusion of child development/Psychology in the curriculum. Starting with the variable gender, there was no significant difference in attitude between male (255.76) and female (257.68) teachers, U = 11307.000, Z = -0.087, p = .931NS. Examining the variable family type, there was no

statistically significant difference in attitude between teachers from nuclear families (266.70) and joint families (241.28), U = 27488.000, Z = -1.865, p = .062NS. Similarly, no significant difference in attitude was observed between teachers who work with a counsellor (249.61) and those who do not (259.70), U = 21628.000, Z = -0.636, p = .525NS.

Differences between type of school on attitude of primary school teachers on Learning Disability

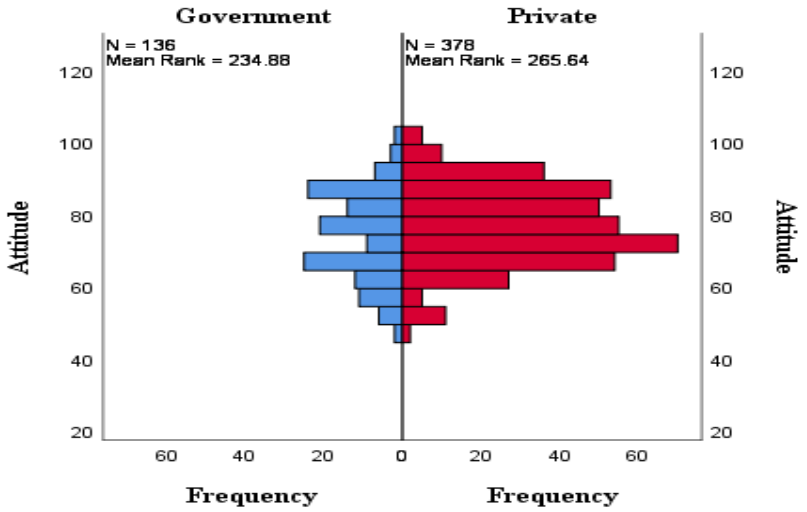


Figure 23

Differences between child development/psychology in curriculum on attitude of primary school teachers on Learning Disability

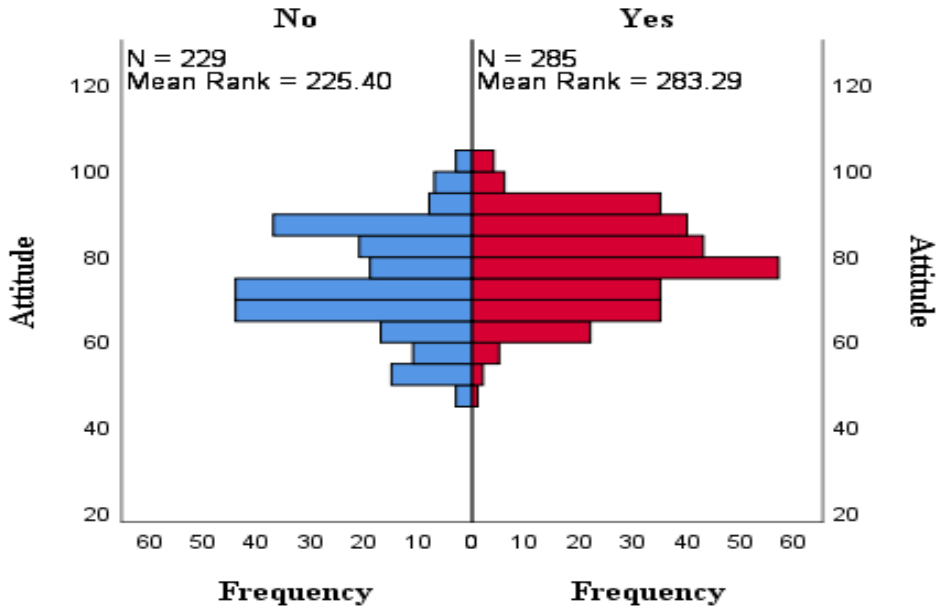


Figure 24

Moving to the influence of the type of school on attitude Table XLV and Figure 23 shows that**,** government school teachers (234.88) and private school teachers (265.64) displayed a significant difference in attitude, U = 22627.500, Z = -2.072, p = .038*. This implies that teachers from private schools exhibited a higher mean rank and, therefore, a favourable attitude towards learning disabilities compared to government school teachers. Lastly, considering the inclusion of child development/psychology in the curriculum (figure 24), a significant difference in attitude was found between teachers whose curriculum includes it (283.29) and those whose curriculum does not (225.40), U = 25282.000, Z = -4.394, p = .0001**, signifying that teachers with this inclusion of child development/psychology have a favourable attitude towards learning disabilities.

These results suggested that formal instruction and school resources related to child development, psychology, and learning disabilities positively shape teacher attitudes. By contrast, personal demographic traits like gender, family type and counselling support do not appear to influence teachers' attitudes towards LD.

Thereby hypothesis $H_0$5 which stated “there will be no influence of socio demographic markers on the attitude of PRTs on LD” was rejected for the variables age, marital status, no of children, educational qualification, years of experience, type of school, board of school, child development /Psychology in curriculum and accepted for gender, area of living, family type, or working with /without counsellor.

d. Socio-demographic markers and practice of primary school teachers on Learning Disability

Examining the nexus between the practices of PRTs and socio-demographic markers regarding Learning Disabilities (LD) is a vital research endeavour with implications for educational efficacy and inclusivity. The study delves into classroom teaching practices and explores how these practices are influenced by socio-demographic characteristics such as age, gender, educational background, and years of teaching experience. Understanding this relationship is crucial for tailoring professional development programmes and support mechanisms that address the unique needs arising from diverse socio-demographic contexts. Therefore, the interaction was examined, tabulated, and discussed below.

Table XLVI *a*

Influence of selected Socio-demographic markers on teachers' practice on learning disability

Socio-demographic markers	Categories	N	Mean Rank	Kruskal Wallis H	df	Sig. (2-tailed)
Age (in years)	21 -30	137	241.73	19.670	3	.0001**
	31 – 40	154	294.78			
	41 – 50	154	257.34			
	51 – 60	69	205.97			
Marital status	Single	84	192.86	23.931	2	.0001**
	Married	419	267.59			
	Widowed	11	366.64			
No of children	0	109	215.51	23.266	3	.0001**
	1	173	265.46			
	2	215	280.76			
	3 or more	17	151.59			
Area of living	Urban	230	248.37	2.347	2	.309^{NS}
	Rural	149	272.21			
	Semi-Urban	135	256.82			
Educational Qualification	Graduation with B.Ed	320	254.51	5.149	2	.076^{NS}
	Graduation without B.Ed	113	282.16			
	Diploma/Teacher training	81	234.91			
Years of Experience	Less than 5 years	155	252.70	19.426	3	.0001**
	6-10years	107	271.36			
	11-15 years	81	312.43			
	More than 15 years	171	227.16			
Board of School	State	424	250.50	26.197	2	.0001**
	CBSC	58	237.61			
	ICSE	32	386.28			
Total		**514**				

NS – Not Significant **Significant at 1% level *Significant at 5% level

Table XLVI *b*

Pair-wise Comparisons (Dunn-Bonferroni post hoc Test) of Teacher's Practice on Learning Disability based on selected socio-demographic markers

Socio-demographic markers	Sample 1 - Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig. [a]
Age (in years)	51 – 60 & 21 -30	35.755	21.859	1.636	.102^{NS}	.611^{NS}
	51 – 60 & 41 – 50	51.373	21.451	2.395	.017*	.100^{NS}
	51 – 60 & 31 – 40	88.805	21.451	4.140	.000**	.0001**
	21- 30 & 41 – 50	-15.618	17.390	-.898	.369^{NS}	1.000^{NS}
	21 -30 & 31 – 40	-53.050	17.390	-3.051	.002**	.014*
	41 – 50 & 31 – 40	37.432	16.875	2.218	.027*	.159^{NS}
Marital status	Single & Married	-74.737	17.702	-4.222	.000**	.0001**
	Single & Widowed	-173.779	47.480	-3.660	.000**	.001**
	Married & widowed	-99.042	45.229	-2.190	.029*	.086^{NS}
No of children	3 or more & 0	63.921	38.613	1.655	.098^{NS}	.587^{NS}
	3 or more & 1	113.874	37.637	3.026	.002**	.015*
	3 or more & 2	129.168	37.307	3.462	.001**	.003**
	0 & 1	-49.953	18.108	-2.759	.006**	.035*
	0 & 2	-65.247	17.411	-3.747	.000**	.001**
	1 & 2	-15.293	15.124	-1.011	.312^{NS}	1.000^{NS}
Years of Experience	More than 15 years & Less than 5 years	25.536	16.422	1.555	.120^{NS}	.720^{NS}
	More than 15 years & 6-10years	44.199	18.252	2.422	.015*	.093^{NS}
	More than 15 years & 11-15 years	85.271	19.973	4.269	.000**	.0001**
	Less than 5 years & 6-10years	-18.663	18.611	-1.003	.316^{NS}	1.000^{NS}
	Less than 5 years & 11-15 years	-59.735	20.302	-2.942	.003**	.020*
	6-10years & 11-15 years	-41.072	21.809	-1.883	.060^{NS}	.358^{NS}
Board of School	CBSC & State Board	12.889	20.731	.622	.534^{NS}	1.000^{NS}
	CBSC & ICSE	-148.669	32.607	-4.559	.000**	.0001**
	State Board & ICSE	-135.780	27.146	-5.002	.000**	.0001**

NS – Not Significant **Significant at 1% level *Significant at 5% level

a. Significance values have been adjusted by the Bonferroni correction for multiple tests

Pair-wise comparison of age on practice of primary school teachers on Learning Disability

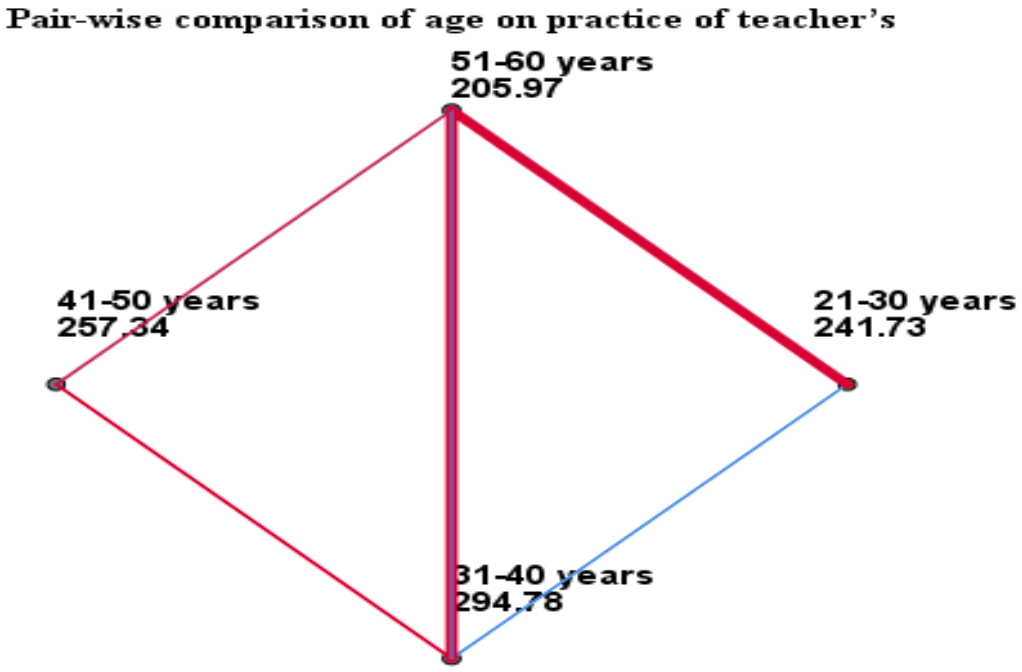


Figure 25

An analysis of Tables XLVI*a* and XLVI*b* examines the influence of socio-demographic markers on teachers' practices regarding learning disabilities. The Kruskal-Wallis H test results in Table XLVI*a* explored variations in teaching practices related to learning disabilities based on demographic aspects like age, marital status, number of children, residential area, educational qualifications, years of experience and school board.

Age was categorised into four groups: 21-30 years, with a mean rank of 241.73; 31-40 years, with a mean rank of 294.78; 41-50 years, with a mean rank of 257.34; and 51-60 years, with a mean rank of 205.97. A significant difference emerged in practice scores across the age categories ($H(3) = 19.670$, $p < .001$**). The pairwise comparison (Figure 25) indicated teachers aged 51-60 years demonstrated satisfactory classroom teaching practices than those aged 31-40 years (adj. sig (p) < .0001**) and 31-40 years showed good/satisfactory teaching practices than 21-30 years ($p = .014$*).

Pair-wise comparison of marital status on practice of primary school teachers on Learning Disability

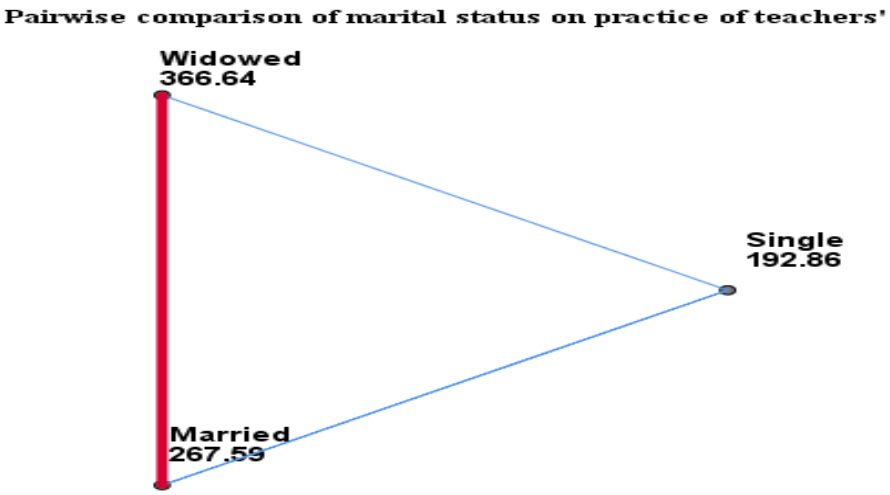


Figure 26

In the variable marital status, it was classified as single with a mean rank of 192.86, married with a mean rank of 267.59, and widowed with a mean rank of 366.64. A significant difference was observed based on marital status (H(2) = 23.931, p < .001**). The pairwise data (table XLVI***b*** and Figure 26) showed single teachers exhibited poor/unsatisfactory teaching practices when compared to married and widowed teachers (adj. sig (p) = .0001**) and (adj. sig (p) = .001**). This inferred marital status influenced teaching practices where married and widowed teachers exhibited good/satisfactory classroom teaching practices.

Pair-wise comparison of number of children on practice of primary school teachers on Learning Disability

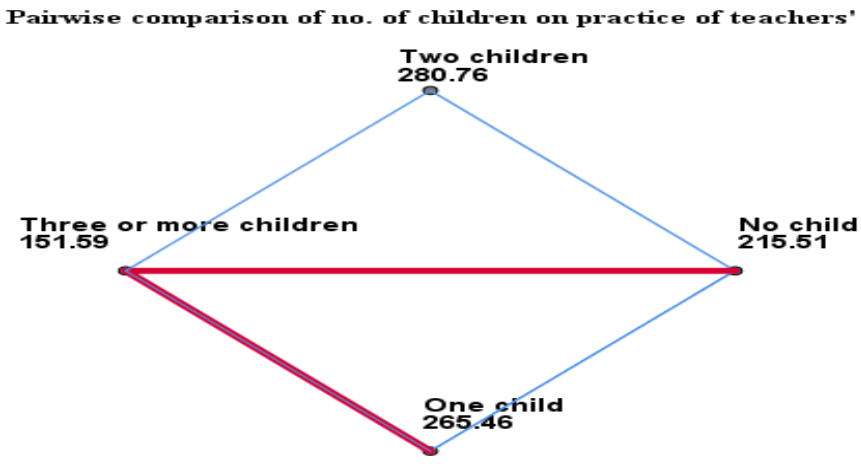


Figure 27

The number of children was distributed across four groups: no children (215.51), one child (265.46), two children (280.76) and three or more children (151.59). A significant difference in practices emerged among the categories as per the Kruskal Wallis H test, H(3) = 23.266, p < .001. From the pair-wise comparison table, Table XLVI*b* and Figure 27, it could be understood that the teachers with one child showed good/satisfactory practices than those with no child (adj. sig (p) = .035*). Similarly, teachers with two children outperformed those with no children (adj. sig (p) = .001**). However, groups with 3 or more children had a significant difference between teachers with one (adj. sig (p) = .015*) and two children (adj. sig (p)= .003**). This hints that parenthood plays a role in enriching teaching practices to a certain threshold signifying that teachers with children had good/satisfactory teaching practices than teachers with no children.

The non-significant differences observed across the area of living and educational qualifications suggested that these socio-demographic markers do not exert a notable influence on the classroom teaching practices of teachers. The findings implied that regardless of whether teachers reside in urban, rural, or semi-urban areas, and irrespective of their educational qualifications, there were no discernible variations in their teaching practices. This uniformity may indicate that factors other than the geographical location of the school or the educational background of teachers played a more substantial role in shaping their classroom teaching practices related to learning disabilities.

Pair-wise comparison of years of experience on practice of primary school teachers on Learning Disability

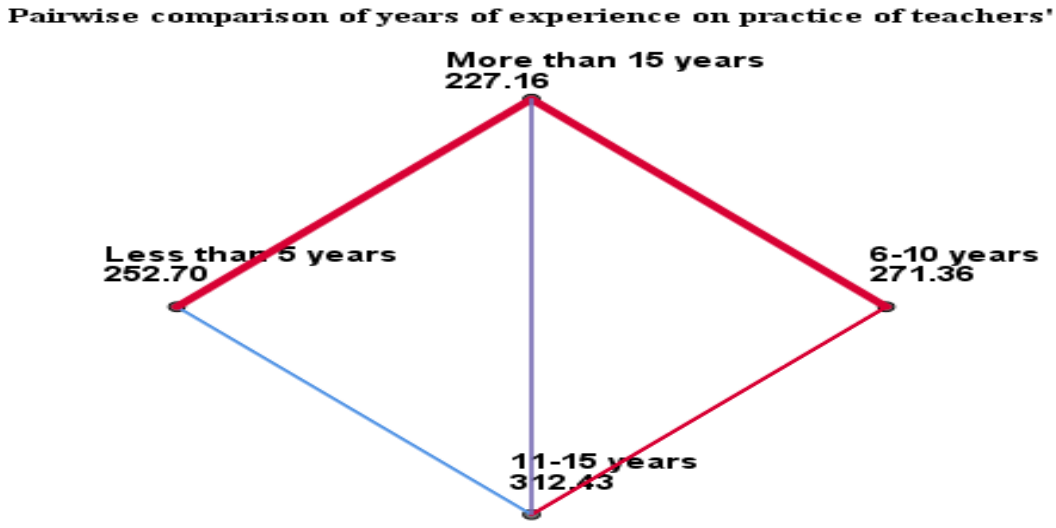


Figure 28

From Table XLVI*a*, the data on years of experience was categorised into less than 5 years with a mean rank of 252.70, 6-10 years with a mean rank of 271.36, 11-15 years with a mean rank of 312.43, and more than 15 years with a mean rank of 227.16. A statistically significant difference emerged between these groups based on the Kruskal Wallis H test, H(3) = 19.426, p < .001**. Specifically (Table XLVI*b* and Figure 28), teachers with 11-15 years of experience demonstrated significantly good/satisfactory teaching practices compared to those with less than 5 years of experience (adj. sig (p) = .020*). These results underscore that teachers with more than 15 years of experience exhibit good/satisfactory classroom teaching practices over other experience brackets. The blend of cultivated skills and continued motivation to develop professionally may explain higher effectiveness in this group.

Pair-wise comparison of board of study on practice of primary school teachers on Learning Disability

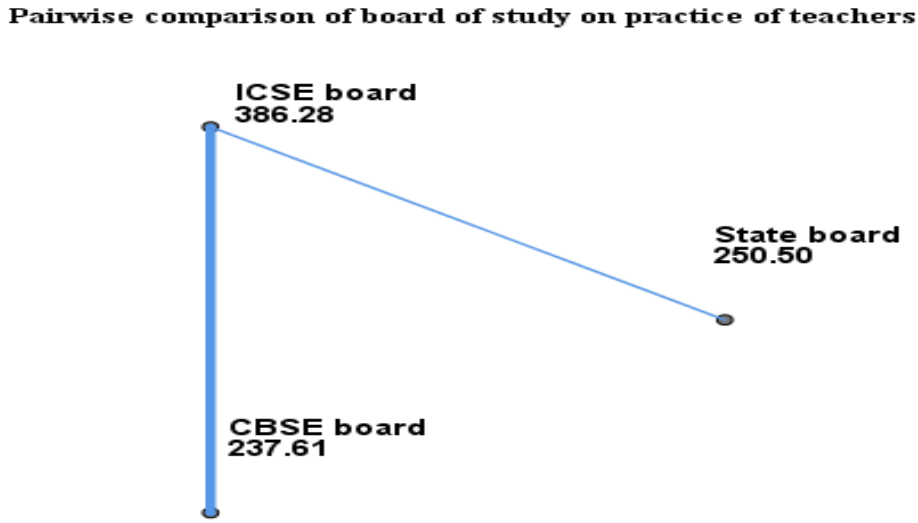


Figure 29

Regarding the board of schools, the data on the school board was segmented into state board (250.50), CBSE (237.61) and ICSE (386.28). A significant difference emerged between groups as per the Kruskal Wallis H test, H(2) = 26.197, p < .001. Pairwise comparisons (Table XLVI*b* and Figure 29) showed that ICSE school teachers exhibited significantly good/satisfactory teaching practices compared to state board teachers (adj. sig (p) < .001**) and CBSE board teachers (adj. sig (p) < .001**). This indicated potential variances in disability-focused training and continuing education influencing the enriched practices associated with ICSE board teachers. Further research controlling for teaching qualifications would help delineate reasons behind ICSE teachers' superior learning disability practices. More

standardised professional development related to effective strategies across school boards could help promote consistent quality.

Table XLVII

Differences between selected socio-demographic markers on practice of teachers on learning disability

Socio-demographic markers	Categories	N	Mean Rank	Mann-Whitney U	Z score	Sig. (2-tailed)
Gender	Male	49	238.19	10446.500	-.960	.337^{NS}
	Female	465	259.53			
Type of school	Government	136	222.96	21006.000	-3.172	.002**
	Private	378	269.93			
Family type	Nuclear	328	266.65	27502.500	-1.861	.063^{NS}
	Joint	186	241.36			
Working with counsellor	Yes	112	253.38	22051.000	-.333	.739^{NS}
	No	402	258.65			
Child development /psychology in curriculum	Yes	285	276.24	27292.500	-3.200	.001**
	No	229	234.18			
Total		514				

NS – Not Significant **Significant at 1% level *Significant at 5% level

Table XLVII provided insights into the impact of socio-demographic markers on the practices of teachers concerning learning disabilities. The Mann-Whitney U test was employed to analyse the markers, including gender, type of school, family type, working with a counsellor, and the inclusion of child development/psychology in the curriculum.

Starting with the variable gender, no significant difference in practices was observed between male (238.19) and female teachers (259.53), U = 10446.500, Z = -0.960, p = .337, that indicated similar practices irrespective of gender. Examining the variable family type, no statistically significant difference in practices was found between teachers from nuclear families (266.65) and joint families (241.36), U = 27502.500, Z = -1.861, p = .063NS. For the working with counsellor variable, no significant difference in teaching practices was observed between teachers who work with a counsellor (253.38) and those who did not (258.65), U = 22051.000, Z = -0.333, p = .739NS, indicated similar practices regardless of counsellor involvement.

Moving to the influence of the type of school on practices (Figure 30), government school teachers (222.96) and private school teachers (269.93) exhibited a significant difference in practices, U = 21006.000, Z = -3.172, p = .002**, suggesting that teachers from private

schools demonstrated good/satisfactory teaching practices related to LD compared to government school teachers.

Differences between type of school on practice of primary school teachers on Learning Disability

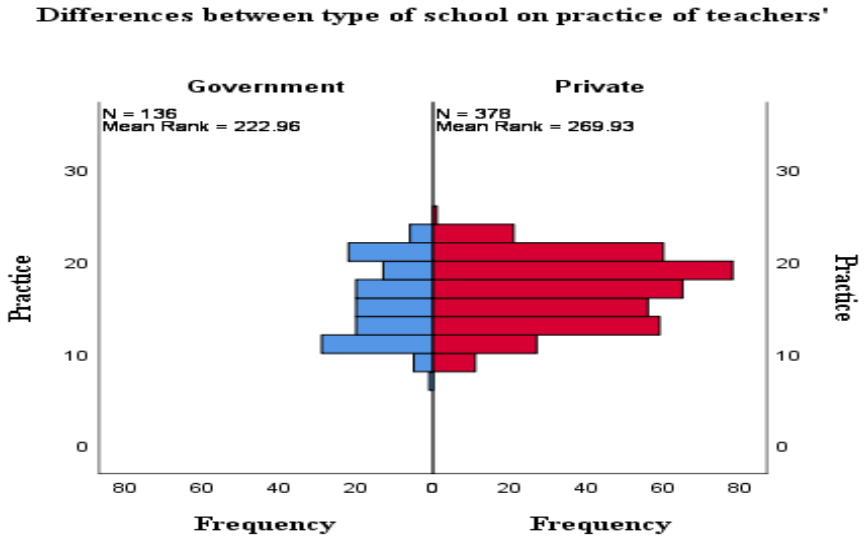


Figure 30

Differences between child development/psychology in curriculum on practice of primary school teachers on Learning Disability

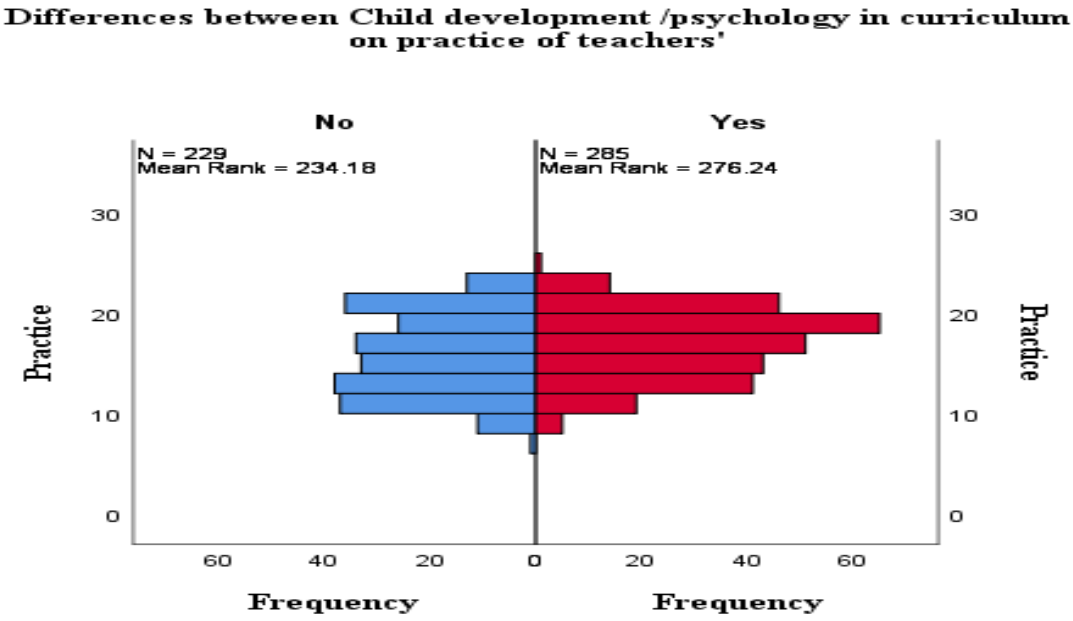


Figure 31

Lastly, considering the inclusion of child development/psychology in the curriculum (Figure 31), a significant difference in practices was found between teachers whose curriculum included it (276.24) and those whose curriculum did not (234.18), U = 27292.500, Z = -3.200, p = .001**, signifying that teachers with this inclusion demonstrate good/satisfactory teaching practices related to learning disabilities.

Hence hypothesis $H_0$6 stated that "there will be no influence of socio demographic markers on the practice of PRTs on LD" was rejected for age, marital status, no of children, years of experience, type of school, board of school, child development /Psychology in curriculum and was accepted for gender, family type, area of living, educational qualification, or working with /without counsellor.

D. Effects of the Sensitisation Programme on KAP of teachers

A sensitisation programme was conducted for teachers, all teachers were approached to participate in the sensitisation programme. A total of 60 teachers gave their consent to participate. Before and after data were collected during sensitisation. Data was taken seven days following the completion of the sensitisation programme, and follow-up data was taken thirty days later. Out of 60 participants, 53 of them completed the programme successfully. Hence, data from the 53 participants were collected and considered for statistical analysis to find the effectiveness of the sensitisation programme.

KAP scores of the teachers were checked to understand responses at various points of time after the sensitisation programme. The data of all three tests namely before, after, and follow-up were compared using Friedmann Test, and Pairwise analysis namely, before and after, before and follow-up, after and follow-up was done with the Wilcoxon Signed Ranks Test.

i. Knowledge of teachers' before and after the sensitisation programme

Knowledge scores before, after and follow-up were compared statistically to check the influence of the sensitisation programme.

Table XLVIII *a*
Knowledge of teachers before and after the sensitisation programme

Test Total	Minimum	Maximum	Mean	SD	Median	Mean Rank	$\chi^2(2)$	p-value
Before	20	47	34.47	6.664	36.00	1.35	35.029	0.0001**
After	23	51	39.62	7.246	40.00	2.31		
Follow-up	12	53	40.87	6.870	42.00	2.34		

* Indicates significant at P< 0.05 ** Indicates significant at P<0.01

Table XLVIII *b*

Significance of difference in knowledge before and after sensitisation programme

Pairs	|Z|	p-value
Before	4.368	0.0001**
After		
Before	5.353	0.0001**
Follow-up		
After	0.725	0.469
Follow-up		

* Indicates significant at P< 0.05 ** Indicates significant at P<0.01

Table XLVIII*a* provided the influence of the sensitisation programme on the knowledge scores through descriptive statistics such as mean, median and SD along with the Friedmann test. The mean score was increased from before to after and after to follow-up. Thus, the Friedmann test showed that these results were statistically significant at 1% levels ($\chi^2(2)=35.029$, p-value<0.01). This indicated that the sensitisation programme had an impact on the knowledge level of the teachers on LD. The mean score (figure 32) of knowledge of the PRTs on LD had increased from a moderate level in the before (34.47) to a higher level in the after and follow-up respectively (39.62 and 40.87). The increase in the knowledge score in follow-up was sustained because the teachers may have started to imply the acquired knowledge in their classroom.

Further, the Wilcoxon Singed rank test (table XLVIII*b*) was administered to see the pair-wise comparison between before to after, before to follow-up and after to follow-up. It was observed that the pairs, before and after (|Z|= 4.368, p-value<0.01), and before and follow-up (|Z|= 5.353, p-value<0.01) showed significant differences in the increase of score at 1% levels. There was no significant difference between after and follow-up (|Z|= 0.725, p-value= 0.469) indicating a significant change in knowledge levels.

A study by Kulkarni et al (2018) on "How effective are disability sensitisation workshops?" suggested that sensitisation workshops were successful about awareness generation. The same result was obtained by many other researchers as well. Shah and Kumar (2012) observed that the sensitisation programme was beneficial in helping teachers to become aware of mental health issues prevalent among school children. Another study by Pawari and Mohite (2014) on the effectiveness of a self-instructional module on knowledge regarding learning disorders among PRTs, concluded that this module was highly effective in improving the knowledge of primary school teachers on learning disability.

Mean scores of knowledge of teachers on Learning Disability

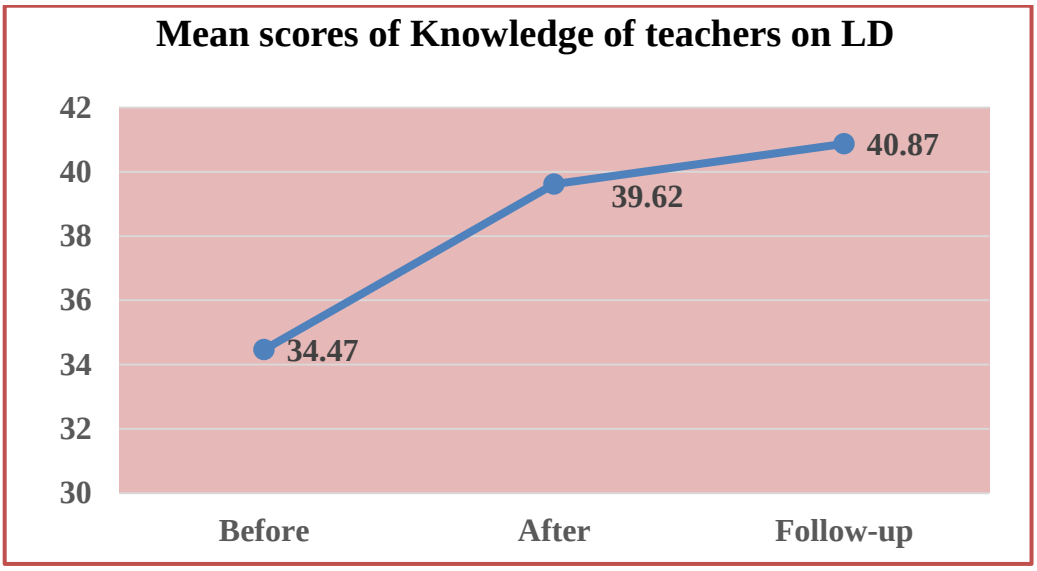


Figure 32

ii. Attitude of teachers on learning disability before and after the sensitisation programme

Attitude Scores of teachers on learning disability before, after and follow-up were compared statistically to check the influence of the sensitisation programme.

Table XLIX

Attitude of teachers before and after the sensitisation programme

Test Total	Minimum	Maximum	Mean	SD	Median	Mean Rank	$\chi^2(2)$	p-value
Before	54	99	84.92	9.192	87.00	2.17	2.964	0.227
After	55	98	83.15	9.046	85.00	1.98		
Follow-up	47	94	82.98	9.635	85.00	1.85		

* Indicates significant at P< 0.05 ** Indicates significant at P<0.01

Descriptive statistics with mean, median and standard deviation along with the Friedmann test were depicted in Table XLIX. It was apparent that the mean score before was slightly higher than the after and follow-up scores. But all three mean scores (before – 84.82, after – 83.15, follow-up – 82.98) indicated a neutral attitude and it was found that there was no significant difference across the groups ($\chi^2(2) = 2.964$, p-value=0.227). Therefore, it could be understood that there was no influence of the sensitisation programme on the attitude of teachers. Wilcoxon Singed rank test was not applicable to be conducted. The attitude remained unchanged even after the increased knowledge score after the sensitisation programme, maybe

because it was hard to change as the change was complex. After all, it required a person to disrupt a habit while simultaneously fostering a new, possibly unfamiliar, set of actions.

However, unlike the current findings a study by Neha and Roopa (2018), revealed that government and private school teachers initially exhibited a moderate level of attitude in the pre-test. However, following the intervention programme, there was a significant shift, with participants demonstrating a favourable attitude towards LD children, and none remaining in the unfavourable attitude category. They concluded that the intervention programme effectively improved the attitudes of the experimental group, as most respondents demonstrated a favourable attitude in the post-test. Learning disabilities disrupt a child's learning and processing abilities, making the attitude of teachers crucial, especially at the elementary school level. Teachers can either support and inspire these children or neglect and discourage them. With patience and guidance, teachers can help these children find the path to success in life.

iii. Practice of teachers on learning disability before and after the sensitisation programme

Table L *a*

Practice of teachers before and after the sensitisation programme

Test Total	Minimum	Maximum	Mean	SD	Median	Mean Rank	$\chi^2(2)$	p-value
Before	10	22	18.96	2.441	20.00	1.75	9.033	0.011*
After	14	23	19.42	2.373	20.00	1.95		
Follow-up	11	24	19.87	2.753	20.00	2.29		

* Indicates significant at P< 0.05 ** Indicates significant at P<0.01

Table L *b*

Significance of difference in practice before and after the sensitisation programme

Pairs	|Z|	p-value
Before	1.129	0.259
After		
Before	2.698	0.007**
Follow-up		
After	1.856	0.063
Follow-up		

* Indicates significant at P< 0.05 ** Indicates significant at P<0.01

Mean scores of practice of teachers on learning disability

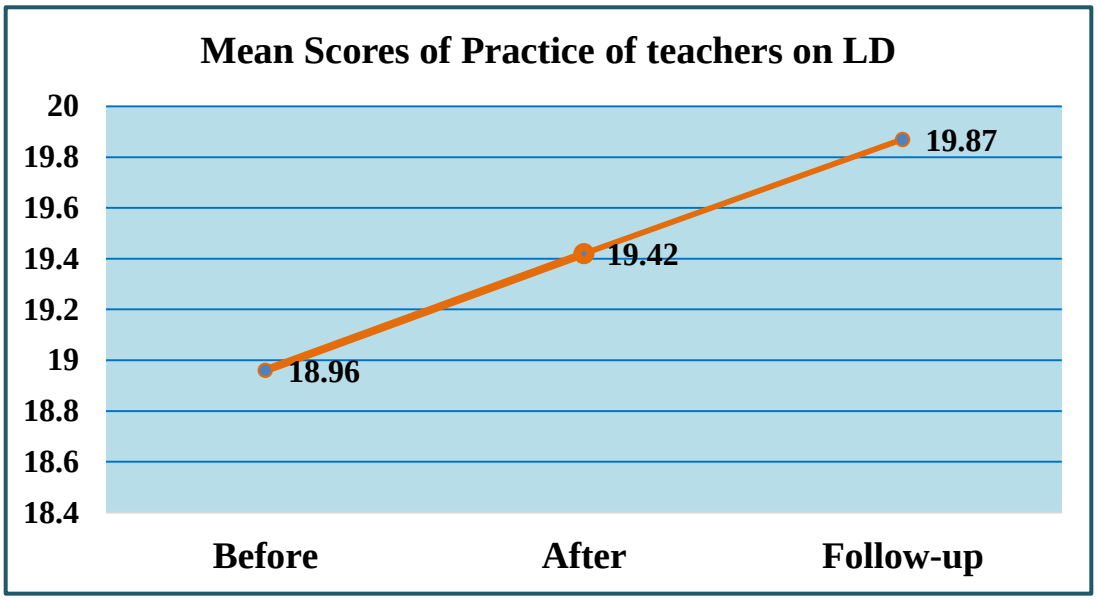


Figure 33

Table L*a* provided the descriptive statistics along with the Friedmann test to compare before, after and follow-up data on teachers' practice. It was found that there was a statistically significant difference found before, after and follow-up. Thus, the Friedmann test showed that these results were statistically significant at 5% levels ($\chi^2(2)=9.033$, p-value< 0.05). It was noticed the mean score increased from before, after and follow-up, indicating the impact of the sensitisation programme on the classroom practice of the teachers. Figure 34 shows the mean score of the practice of the PRTs, which had increased from an average level before (18.96) to good/satisfactory level, after and follow-up respectively (19.42 and 19.87). The increase in the practice score in follow-up was persistent because the teachers may have started to apply the acquired knowledge in their classroom teaching practices. Since there was a significant difference in the Friedmann test, pairwise analysis was done by using the Wilcoxon Signed Ranks Test as shown in Table L*b*. A statistically significant difference was found across the before and follow-up pair (|Z|= 2.698, p-value= 0.007**). This implied that there was no obvious change in practice from before to after but the change from before to follow-up was significant. This could be because knowledge was the predictor of behaviour according to "The Theory of Planned Behaviour (Ajzen, 1991)". The significant change in follow-up was inferred because time is needed to change a long-term practice hence follow-up had a higher mean score showing that the teachers took almost a month after the sensitisation programme to practice the gained knowledge. In addition, the knowledge level in follow-up was comparatively higher than in 'after' which could have aided in the good/satisfactory teaching practices.

Hence, hypothesis $H_0$7 stated that “Sensitisation programme will not have a significant change in the KAP of primary school teachers on LD” was rejected for knowledge, practice and accepted for attitude.

The current study and various research studies collectively underscore the significance and impact of sensitisation and training programmes on teachers' knowledge, attitudes, and practices concerning learning disability. George et al. (2015) conducted a study in Puducherry, adopting a true experimental pretest-posttest control group design. The findings revealed that a structured teaching program had significantly increased the knowledge of PRTs regarding SLD, emphasising the impact of targeted training on enhancing educators' understanding. Pawar and Mohith's (2014) study in Karad, Maharashtra, specifically focused on a self-instructional module. The findings concluded that the self-instructional module had significantly improved the knowledge of PRTs regarding LD, underscoring the effectiveness of targeted instructional materials in teacher training. Together, these studies emphasise the ongoing importance of sensitisation and training programmes in enhancing educators' abilities to address the challenges posed by learning disabilities. Rajesh and Joseph (2023) developed a Competency-Based Teacher Education (CBTE) module to improve teachers' knowledge, attitudes, and practices (KAP) regarding learning disabilities. Their study found the CBTE module effectively enhanced teachers' understanding and skills in identifying and managing learning disabilities, thereby improving support for LD children. Lalitha and Padmavathi's (2009) research in Kolar district, Karnataka, further supported the positive outcomes of a structured teaching programme. Their study demonstrated significant knowledge gains among teacher trainees regarding learning disabilities, reinforcing the role of well-designed training initiatives.