Chapter – IV: Data Analysis and Interpretation

Chapter 4: Data Analysis and Interpretation

4.1 Introduction

Data analysis is a crucial phase of any research study, serving to summarize and make sense of the collected data to answer research questions and test hypotheses. According to Wilkinson and Bhandarkar (1994), data analysis involves categorizing, ordering, manipulating, and summarizing data to obtain answers to research questions. Furthermore, data interpretation is the process of assigning meaning to the analyzed data to draw valid conclusions and evaluate the significance of the findings.

In the present study, the researcher investigated the role of migration program on the academic performance of students of Jawahar Navodaya Vidyalaya (JNV).

4.2 Objectives

The study has following objectives:

1) To compare the academic performance of JNV students before and after their participation in the migration program.
2) To compare the academic outcomes between migrants and non-migrants students.
3) To compare the academic performance between migrated boys and migrated girls after participating in the migration program.

4.3 Null Hypotheses

The study has the following null-hypotheses:

1. $H_{0.1}$: There is no significant difference in the academic performance of JNV students before and after their participation in the migration program.
2. $H_{0.2}$: There is no significant difference in the academic outcomes between migrants and non-migrants students.
3. $H_{0.3}$: There is no significant difference in the academic performance of migrated boys and migrated girls after participating in the migration program.

4.4 Objective-wise Analysis and Interpretation of the Data

4.4.1 Objective 1:

To compare the academic performance of JNV students before and after their participation in the migration program.

4.4.1.1 Hypothesis $H_{0.1}$:

H_{01}: There is no significant difference in the academic performance of JNV students before and after their participation in the migration program.

Table 4.1: Difference in Academic Performance Before and After Migration

Test Phase	Mean Score	Standard Deviation	Sample Size	t-Value	Degrees of Freedom	p-Value	Significance Level	Remark
Before Migration	75.76	10.24	80	5.11	79	0.00000217	0.05	Significant
After Migration	70.62	11.67	80					

As per the results obtained – since $p<0.05$, Null Hypothesis $H_{0.1}$ is rejected.

4.4.1.2 Analysis:

From Table 4.1, the mean academic score before migration was 75.76, while the mean score after migration was 70.62, resulting in a mean decrease of 5.14 points. The calculated t-value is 5.11 with 79 degrees of freedom. The p-value associated with this result is 0.00000217, which is far below the standard significance level of 0.05.

As the calculated t-value exceeds the critical t-value (approximately 2.00 at 0.05 level for df = 79), the result is statistically significant. Hence, the null hypothesis $H_{0.1}$ is rejected.

4.4.1.3 Interpretation:

There is a statistically significant decline in the academic performance of JNV students after participating in the migration program. The results show that migration appears to have a negative impact on students' academic achievement as measured by their official scores.

4.4.1.4 Result:

The analysis reveals that the academic scores of students decreased significantly after migration. This suggests that participation in the migration program is associated with lower academic outcomes, at least during the transition period.

4.4.1.5 Justification:

Several possible reasons could explain the observed decline in academic performance post-migration:

- Adjustment challenges in a new environment, including psychological and emotional stress.
- Disruption in academic continuity due to school and regional transitions.
- Language or cultural barriers, especially if the migration involved a shift to a different linguistic region.
- Reduced academic support or delayed adaptation to new academic expectations.

While the migration program in JNVs aims to offer diverse exposure and broaden student experience, these transitional hurdles might initially hinder academic performance. The results suggest that additional support systems—such as orientation programs, counseling, and academic bridging—may help students adapt more smoothly and maintain academic standards.

4.4.2 Objective 2:

To compare the academic outcomes between migrants and non-migrants students.

4.4.2.1Hypothesis $H_{0.2}$:

$H_{0.2}$: There is no significant difference in the academic outcomes between migrants and non-migrants students.

Table 4.2: Comparison of Academic Performance between Migrated and Non-Migrated Students

Group	Mean Score	Known Variance	Sample Size	z-Value	p-Value (two-tailed)	z-Critical (0.05)	Remark
Migrated Students	70.62	93.56	80	0.31	0.757	±1.96	Not Significant
Non-Migrated Students	71.16	147.72	80				

As per the results obtained – since p>0.05, Null Hypothesis $H_{0.2}$ is accepted.

4.4.2.2 Analysis:

From Table 4.2, the mean academic score of the migrated group is 70.62, while that of the non-migrated group is 71.16, showing a small difference of 0.54 points. The calculated z-value is 0.31, which is well within the critical range of ±1.96 at the 0.05 level of significance.

The p-value of 0.757 is much higher than the threshold of 0.05, indicating that the difference between the groups is not statistically significant.

4.4.2.3 Interpretation:

Although the non-migrated students had a slightly higher mean score, the difference is not statistically significant. This implies that, on average, migration did not result in a substantial academic disadvantage when compared directly with peers who did not migrate.

4.4.2.4 Result:

The null hypothesis is accepted. There is no significant difference in academic performance between migrated and non-migrated students. While individual performance may vary, as groups, they performed similarly in their academic outcomes.

4.4.2.5 Justification:

The non-significant difference between the two groups may indicate:

- Post-migration adjustment, where migrated students gradually adapted and caught up academically.
- Support mechanisms at JNVs (e.g., peer support, structured academics, uniform curriculum) possibly helped migrated students bridge the gap.
- Equivalence of curriculum and examination standards across JNVs ensured consistency in academic expectations.

Despite earlier challenges seen in the within-group pre/post analysis, this between-group analysis suggests that, over time, migrated students perform at a level comparable to their non-migrated peers. This outcome reflects positively on the standardized education and integration framework of the JNV system.

4.4.3 Objective 3:

To compare the academic performance between migrated boys and migrated girls after participating in the migration program.

4.4.3.1 Hypothesis $H_{0.3}$:

$H_{0.3}$: There is no significant difference in the academic performance of migrated boys and migrated girls after participating in the migration program.

Table 4.3: Comparison of Academic Performance Between Migrated Boys and Migrated Girls

Group	Mean Score	Known Variance	Sample Size	t-Value	p-Value (two-tailed)	z-Critical (0.05)	Remark
Migrated Boys	69.49	165.70	30	-1.13	0.264	±2.00	Not Significant
Migrated Girls	73.03	129.99	30				

As per the results obtained – since p>0.05, Null Hypothesis $H_{0.3}$ is accepted

4.4.3.2 Analysis:

From Table 4.3, the mean academic score of migrated boys is 69.49**,** while that of migrated girls is 73.03, with a difference of 3.54 points. The computed t-value is -1.13, which lies within the acceptance region defined by the critical value ±2.00 at the 0.05 level of significance.

The p-value (two-tailed) is 0.264**,** which is significantly higher than the 0.05 threshold. This suggests that the difference in mean scores between the two gender groups is not statistically significant.

4.4.3.3 Interpretation:

Although migrated girls had a higher average score than boys, this difference is not statistically significant**.** This implies that gender does not play a major role in determining academic performance among migrated students post-migration.

4.4.3.4 Result:

The null hypothesis is accepted. There is no significant gender-based difference in academic performance among migrated students. This suggests that, overall migration impacts boys and girls similarly in terms of academic achievement.

4.4.3.5 Justification:

The similarity in academic performance may be due to several factors:

- Uniform teaching and evaluation standards across JNVs.
- Gender-equitable opportunities and support systems in place within the migration framework.
- Both boys and girls facing similar adjustment challenges and coping mechanisms in their new environments.

This result supports the idea that the migration program is gender-neutral in its academic outcomes, offering equal opportunities for learning and performance to both male and female students.