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# **CHAPTER FOUR (4)**

## **4.0 RESULTS**

### 4.1 Relative Abundance of Bacteria

#### 4.1.1 Abundance of bacteria in each hospital ward.

The graph illustrates the relative abundance of various bacterial species in three different wards: the Children's Ward, the Neonatal Ward, and the Outpatient Department (OPD). In the Children's Ward, Pseudomonas Sp is the most prevalent bacterium with 13 occurrences, followed by Bacillus Sp with 9 occurrences. Staphylococcus and Enterobacter are minimally present with 1 occurrence each, while E. coli is absent. In the Neonatal Ward, Staphylococcus and Pseudomonas Sp are the most common, with 7 and 6 occurrences respectively. Enterobacter and E. coli are present in lower numbers, with 2 and 3 occurrences respectively, and Bacillus Sp is absent. In the Outpatient Department (OPD), Pseudomonas Sp and Bacillus Sp are present with 3 and 2 occurrences respectively, while Staphylococcus, Enterobacter, and E. coli are absent. This data highlights the variations in bacterial abundance across different wards, with Pseudomonas Sp being the most dominant bacterium overall, particularly in the Children's Ward.

Figure 1:RELATIVE ABUNANCE OF BACTERIA IN EACH OF THE WARDS

#### 4.1.2 Abundance of each bacteria in the hospital wards.

The graph illustrates the relative abundance of different bacterial species across the hospital wards, represented by the total number of occurrences for each species. The bacterial species included are Staphylococcus, Pseudomonas Sp, Bacillus Sp, Enterobacter Sp, and E. coli. Among these, Pseudomonas Sp is the most prevalent bacterium, with a total of 22 occurrences. Bacillus Sp follows with 11 occurrences, while Staphylococcus is also relatively common with 8 occurrences. Enterobacter Sp and E. coli are the least abundant, each with 3 occurrences. This data highlights that Pseudomonas Sp is the most dominant bacterium in the hospital wards, significantly outnumbering the other bacterial species.

Figure 2: ABUNDANCE OF EACH BACTERIA IN THE HOSPITAL WARDS

#### 4.1.3 Total abundance of bacteria in the hospital wards.

The graph depicts the abundance of bacteria in three different hospital wards: the Neonatal Ward, the Children's Ward, and the Outpatient Department (OPD). In the Children's Ward, the total number of bacterial occurrences is the highest, with 27 instances recorded. The Neonatal Ward follows with 15 occurrences, while the OPD has the least abundance of bacteria, with only 5 occurrences. This data highlights the variations in bacterial presence across different hospital wards, with the Children's Ward exhibiting the highest bacterial load.

Figure 3: ABUNDANCE OF BACTERIA IN THE HOSPITAL WARDS

#### 4.1.4 Mean and ANOVA

The table provides the mean and standard deviation of bacterial occurrences for different hospital wards, offering a statistical summary of the data. In the Children's Ward, the mean number of bacterial occurrences is 2.42 with a standard deviation of 0.654. This indicates that the bacterial counts are relatively consistent, with most values close to the mean. The Neonatal Ward has a mean of 1.80 and a higher standard deviation of 1.014, suggesting more variability in bacterial occurrences compared to the Children's Ward. For the OPD, the mean is 2.40 with a standard deviation of 0.548, indicating that the bacterial counts are quite consistent and similar to the Children's Ward. Overall, the total mean across all wards is 2.20 with a standard deviation of 0.823. This aggregate data provides a general overview of bacterial occurrences across the hospital wards, highlighting the relatively consistent presence of bacteria with some variability, particularly in the Neonatal Ward.

Table 1: MEAN and STANDARD DEVIATION OF BACTERIAL COUNTS IN THE WARDS

|  |  |  |
| --- | --- | --- |
| **MEAN and STANDARD DEVIATION** | | |
| Possible\_Organism | | |
| Ward | Mean | Std. Deviation |
| Children's Ward | 2.42 | .654 |
| Neonatal | 1.80 | 1.014 |
| OPD | 2.40 | .548 |
| Total | 2.20 | .823 |

The ANOVA table provides a statistical analysis to determine if there are significant differences in the mean bacterial occurrences between the different hospital wards. The results indicate that the variation between the groups, represented by a sum of squares of 3.726 and a mean square of 1.863, yields an F-value of 3.003 with a significance level (p-value) of 0.061. This suggests that the differences in bacterial occurrences between the wards are not statistically significant at the 0.05 level, as the p-value is slightly above the threshold. The linearity component, with a sum of squares of 0.814 and a mean square of 0.814, results in an F-value of 1.312 and a p-value of 0.259, indicating that the linear relationship between the wards and bacterial occurrences is not statistically significant. However, the deviation from linearity, which has a sum of squares of 2.912, a mean square of 2.912, an F-value of 4.694, and a p-value of 0.036, is statistically significant, suggesting that the relationship between the wards and bacterial occurrences is not perfectly linear. The within-groups variation, with a sum of squares of 25.433 and a mean square of 0.620, represents the variability within each ward. The total sum of squares, combining both between-group and within-group variations, is 29.159 with 43 degrees of freedom. In summary, the ANOVA results suggest that while there is some indication of differences in bacterial occurrences between the different wards, the overall difference is not statistically significant at the 0.05 level. However, the significant deviation from linearity indicates that the relationship between the wards and bacterial occurrences is complex and not strictly linear.

Table 2: ANOVA TABLE

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ANOVA Table** | | | | | | | |
|  | | | Sum of Squares | df | Mean Square | F | Sig. |
| Possible\_Organism \* Ward | Between Groups | (Combined) | 3.726 | 2 | 1.863 | 3.003 | .061 |
| Linearity | .814 | 1 | .814 | 1.312 | .259 |
| Deviation from Linearity | 2.912 | 1 | 2.912 | 4.694 | .036 |
| Within Groups | | 25.433 | 41 | .620 |  |  |
| Total | | 29.159 | 43 |  |  |  |

### 4.2 Relative Abundance of Fungi

#### 4.2.1 Abundance of fungi in each hospital ward.

The figure below illustrates the relative abundance of various fungal species across different hospital wards: Neonatal, Children's Ward, and Outpatient Department (OPD). In the Neonatal Ward, Aspergillus niger (A. niger) is present with a count of 33, while Aspergillus fumigatus (A. fumigatus) is more abundant with a count of 45. Other fungi present include Colletotrichum (4), Penicillium (3), Aspergillus flavus (A. flavus) (1), and Curvularia (1). In the Children's Ward, Aspergillus niger (A. niger) has a count of 18, whereas Aspergillus fumigatus (A. fumigatus) shows a significantly higher abundance with a count of 133. Colletotrichum is also present with a count of 8, but Penicillium, Aspergillus flavus (A. flavus), and Curvularia are absent in this ward. In the OPD, Aspergillus niger (A. niger) has a count of 13, Aspergillus fumigatus (A. fumigatus) has a count of 20, and Colletotrichum has a count of 2. Curvularia is present with a count of 3, but Penicillium and Aspergillus flavus (A. flavus) are not found. Overall, Aspergillus fumigatus (A. fumigatus) shows the highest relative abundance in the Children's Ward with a count of 133, while Aspergillus niger (A. niger) is present in all wards, with the highest count in the Neonatal Ward (33). Colletotrichum is present in the Neonatal and Children's Wards, with minimal presence in the OPD. Penicillium is found only in the Neonatal Ward, Aspergillus flavus (A. flavus) is present only in the Neonatal Ward, and Curvularia is found in the Neonatal Ward and OPD but not in the Children's Ward.

Figure 4: ABUNDANCE OF FUNGI IN EACH HOSPITAL WARD

#### 4.2.2 Abundance of each fungi in the hospital wards.

The figure below displays the relative abundance of various fungal species across the hospital wards. Aspergillus fumigatus (A. fumigatus) shows the highest relative abundance with a count of 198, indicating its significant predominance among the fungal species present. Aspergillus niger (A. niger) follows with a count of 64, while Colletotrichum is present with a count of 14. Penicillium has a count of 3, and Aspergillus flavus (A. flavus) shows the lowest abundance with a count of 1. Curvularia is present with a count of 4. This figure highlights the substantial presence of Aspergillus fumigatus (A. fumigatus) compared to other fungal species in the hospital wards.

Figure 5: ABUNDANCE OF EACH FUNGI IN THE HOSPITAL WARDS

#### 4.2.3 Total abundance of fungi in the hospital wards.

The figure shows the relative abundance of fungi across three hospital wards: Neonatal, Children's Ward, and Outpatient Department (OPD). The data indicates that the Children's Ward has the highest abundance of fungi with a count of 159. The Neonatal Ward follows with a fungi count of 87, and the OPD has the lowest fungi abundance with a count of 38. This figure highlights that the Children's Ward has a significantly higher presence of fungi compared to the other wards, with the Neonatal Ward having more fungi than the OPD but less than the Children's Ward.

Figure 6: ABUNDANCE OF FUNGI IN THE HOSPITAL WARDS