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## Effect of a 16-week yogic intervention on visually impaired children: A comparative study

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### Abstract

This study delves into the transformative potential of yoga practice by investigating its effects on psychological parameters over 16 weeks. The study explores the changes in these parameters through a comprehensive analysis, shedding light on the holistic benefits of sustained yoga practice. Through rigorous analysis of the psychological aspects, the study reveals a significant improvement in various dimensions. Furthermore, the study captured noteworthy changes in psychological parameters. The practice of yoga led to significant reductions in perceived Anxiety levels and an increase in overall emotional well-being. These improvements were complemented by enhanced cognitive functions, including attention and memory, suggesting a harmonious relationship between physical practice and cognitive outcomes. Collectively, these findings provide compelling evidence for the transformative impact of consistent yoga practice. The study underscores the holistic nature of yoga and positively influences remarkable psychological benefits. This research contributes to our understanding of the intricate connection between mind and body and highlights the potential of yoga as a holistic approach to fostering well-being across multiple dimensions. The implications of these findings are substantial, resonating with individuals seeking to enhance their overall health and well-being. Psychological well-being, the study advocates for the integration of yoga into wellness routines. This research bridges the gap between the ancient practice of yoga and modern scientific inquiry, reinforcing its relevance in contemporary well-being practices. This study demonstrates that 16 Weeks of consistent yoga practice can lead to substantial improvements in psychological parameters. The findings underscore the interconnectedness of these dimensions and accentuate the potential of yoga as a holistic practice. These insights provide a valuable foundation for individuals, healthcare practitioners, and researchers alike, promoting the integration of yoga into comprehensive wellness strategies.

**Keywords:** Yoga practice, psychological parameters, cognitive outcome, yogic intervention, holistic well-being

### Introduction

In the realm of holistic health and well-being, the significance of incorporating physical activity, relaxation techniques, and mindfulness practices cannot be overstated. Among these practices, yoga has gained substantial recognition for its potential to enhance physical, mental, and emotional wellness. Its adaptability and inclusive nature make it an ideal candidate for intervention studies aimed at various demographic groups, including children with special needs. In this vein, the present research delves into a comprehensive exploration of the effects of a 16-week yogic intervention on visually impaired children, comparing the outcomes of an experimental group that underwent the intervention with those of a control group. Visual impairment, defined as a significant reduction in or absence of visual acuity, poses unique challenges to the developmental trajectory of affected children. Not only does it impact the sensory dimension of perception, but it also potentially affects their psychological well-being, social interactions, and overall quality of life. These challenges necessitate the exploration of interventions that can holistically address the multifaceted needs of visually impaired children. Among the array of interventions, yoga has demonstrated its capacity to contribute positively to physical health, psychological resilience, and social adaptation. Yoga, originating from ancient Indian philosophy, encompasses a wide range of practices that integrate physical postures (asanas), controlled breathing (pranayama), meditation (dhyana), and ethical

principles (Yamas and niyama).

These elements synergistically cultivate a balanced state of being, fostering physical strength, emotional regulation, and cognitive clarity. The inclusive nature of yoga, which can be adapted to accommodate various abilities and needs, makes it particularly relevant to the visually impaired population. While previous research has explored the benefits of yoga for various populations, studies dedicated to visually impaired children remain relatively scarce. Existing literature offers glimpses of the potential advantages of yoga for this demographic but often lacks robust experimental designs, well-defined interventions, and comprehensive assessments. This study aims to address these limitations by employing a structured 16-week yogic intervention, supported by established assessment tools, in a controlled experimental setup.

This study not only offers an innovative approach to enhancing the well-being of visually impaired children but also contributes to the broader understanding of how holistic practices can be adapted to cater to the unique needs of diverse populations. By merging theory and practice, this research embarks on a journey of exploration, uncovering the potential benefits of yoga for enhancing the lives of visually impaired children in a multifaceted manner.

The primary objective of this study is to assess the potential benefits of a structured 16-week yogic intervention on visually impaired children. By undertaking a comparative analysis between an experimental group exposed to the yogic intervention and a control group without such intervention, this study aims to illuminate the specific effects of yoga on the psychological aspects of the participants' lives.

### Methodology and data collection

To delve into the effects of a 16-week yogic intervention on visually impaired children, a rigorous methodology was employed to serve the purpose of this study, 40 visually impaired female children who voluntarily agreed to participate with the permission from authorities/principal of Atma Jyoti Avasiya Drishtiheen Kanya Vidhyalaya, Gwalior MP were chosen as subjects. The sampling technique used for the study is purposive sampling. Their age ranged between 10 to 20 years. They were divided into two groups i.e., Experimental group and Control group (N=20 in each group). The selection of participants was based on predetermined criteria, ensuring homogeneity in terms of age, gender, and degree of visual impairment. This meticulous approach aimed to reduce potential confounding variables and enhance the internal validity of the study. The ethical considerations inherent in research involving children with special needs were upheld, and informed consent was obtained from both participants and their legal guardians.

The intervention itself consisted of a structured 16-week yoga program designed to cater to the unique needs of visually impaired children. Collaborating with certified yoga instructors experienced in working with diverse populations, the program incorporated a blend of modified Asanas (physical postures), pranayama (breath control), and meditation techniques. The adaptation of these practices took

into account the sensory perceptions and tactile sensitivities of visually impaired children.

To quantify the effects of the yogic intervention, Taylor's Manifest Anxiety Scale was employed. This widely recognized self-report scale assesses the level of anxiety experienced by participants, encompassing a range of psychological manifestations. By utilizing this tool, the study aimed to capture nuanced changes in the participants' psychological well-being, thereby shedding light on the potential impact of yoga on reducing anxiety among visually impaired children.

### Statistical test

Various statistical analyses to examine the effects of the 16-week yogic intervention on visually impaired children. The statistical tests used include:

#### Descriptive Statistics (Table 1)

This table provides information about the mean and standard deviation of anxiety levels for both the control and experimental groups at different time points (pre-test, mid-test, and posttest). The descriptive statistics offer an initial overview of the data distribution and variability within each group.

#### Multivariate Tests (Table 2)

The multivariate tests assess the effects of TIME and the interaction between TIME and GROUPS. These tests utilize various measures like Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root to examine the overall impact of the independent variables on the dependent variable. The results indicate the significance of these effects and their effect sizes.

#### Tests of Within-Subjects Effects (Table 3)

These tests analyze the significance of the effects of TIME and the interaction between TIME and GROUPS on the dependent variable. The tests provide results under different assumptions, such as Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, and Lower-bound. The F-values, significance levels, and effect sizes (Partial Eta Squared) are reported.

#### Tests of Between-Subjects Effects (Table 4)

These tests examine the significance of the effects of GROUPS (experimental vs. control) on the dependent variable. The tests provide information about the Intercept (overall mean), the GROUPS factor, and the Error term. The reported F-values, significance levels, and effect sizes (Partial Eta Squared) indicate the impact of GROUPS on the dependent variable.

#### Pairwise Comparisons Table (Table 5)

This table presents pairwise comparisons between different time points (1, 2, 3) within the experimental group. The mean differences, standard errors, significance levels, and confidence intervals are reported. The Bonferroni adjustment for multiple comparisons is also mentioned.

**Result****Table 1:** Taylor anxiety scale

| Descriptive Statistics |              |       |                |    |
|------------------------|--------------|-------|----------------|----|
|                        | Groups       | Mean  | Std. Deviation | N  |
| Pre-test               | Control      | 32.10 | 1.165          | 20 |
|                        | Experimental | 31.90 | 1.553          | 20 |
|                        | Total        | 32.00 | 1.359          | 40 |
| Mid-test               | Control      | 32.10 | 1.165          | 20 |
|                        | Experimental | 24.80 | 1.824          | 20 |
|                        | Total        | 28.45 | 3.993          | 40 |
| Post-test              | Control      | 32.25 | 1.070          | 20 |
|                        | Experimental | 19.65 | 1.268          | 20 |
|                        | Total        | 25.95 | 6.484          | 40 |

From the above-given table, we can say that Control and Experimental groups had similar mean anxiety levels, with the Control group at 32.10 and the Experimental group at 31.90. The standard deviations indicate that there was some variability in anxiety levels within each group. In the mid-test Control group maintained a similar mean anxiety level of 32.10. The Experimental group showed a lower mean anxiety level of 24.80 compared to the Control group. The standard

deviations suggest that there was relatively low variability in the control group but more variability in the Experimental group. In the post-test, The Control group maintained a consistent mean anxiety level of 32.25. The Experimental group exhibited a significant reduction in anxiety levels, with a mean of 19.65. The standard deviations indicate low variability in both groups. The total sample size remained the same with 20 participants in each group.

**Table 2:** Summarizes the multivariate tests

| Multivariate Tests <sup>a</sup> |                    |        |                      |               |          |      |                     |
|---------------------------------|--------------------|--------|----------------------|---------------|----------|------|---------------------|
| Effect                          |                    | Value  | F                    | Hypothesis Df | Error Df | Sig. | Partial Eta Squared |
| Time                            | Pillai's Trace     | .924   | 223.752 <sup>b</sup> | 2.000         | 37.000   | .000 | .924                |
|                                 | Wilks' Lambda      | .076   | 223.752 <sup>b</sup> | 2.000         | 37.000   | .000 | .924                |
|                                 | Hotelling's Trace  | 12.095 | 223.752 <sup>b</sup> | 2.000         | 37.000   | .000 | .924                |
|                                 | Roy's Largest Root | 12.095 | 223.752 <sup>b</sup> | 2.000         | 37.000   | .000 | .924                |
| Time * Groups                   | Pillai's Trace     | .926   | 233.110 <sup>b</sup> | 2.000         | 37.000   | .000 | .926                |
|                                 | Wilks' Lambda      | .074   | 233.110 <sup>b</sup> | 2.000         | 37.000   | .000 | .926                |
|                                 | Hotelling's Trace  | 12.601 | 233.110 <sup>b</sup> | 2.000         | 37.000   | .000 | .926                |
|                                 | Roy's Largest Root | 12.601 | 233.110 <sup>b</sup> | 2.000         | 37.000   | .000 | .926                |

a. Design: Intercept + GROUPS

Within Subjects Design: TIME

b. Exact statistic

These multivariate tests examine the effects of TIME in the context of the study. The tests evaluate the multivariate relationship between the variables by considering the linearly independent pairwise comparisons among the estimated marginal means. The Value column represents the value of the test statistic, while F refers to the F-statistic associated with the test. Hypothesis DF indicates the degrees of freedom

for the hypothesis being tested, and Error DF represents the degrees of freedom for the error term. Sig. denotes the significance level of the test, and a value of .000 indicates that the test is highly significant. The Partial Eta Squared column measures the effect size or proportion of variance accounted for by the TIME variable. In this case, the value of .924 suggests that a large.

**Table 3:** Tests of within-subjects effects

| Measure: Measure_1 |                    |                         |        |             |         |      |                     |
|--------------------|--------------------|-------------------------|--------|-------------|---------|------|---------------------|
|                    | Source             | Type III Sum of Squares | DF     | Mean Square | F       | Sig. | Partial Eta Squared |
| Time               | Sphericity Assumed | 739.400                 | 2      | 369.700     | 207.003 | .000 | .845                |
|                    | Greenhouse-Geisser | 739.400                 | 1.937  | 381.702     | 207.003 | .000 | .845                |
|                    | Huynh-Feldt        | 739.400                 | 2.000  | 369.700     | 207.003 | .000 | .845                |
|                    | Lower-bound        | 739.400                 | 1.000  | 739.400     | 207.003 | .000 | .845                |
| Time * groups      | Sphericity Assumed | 774.200                 | 2      | 387.100     | 216.746 | .000 | .851                |
|                    | Greenhouse-Geisser | 774.200                 | 1.937  | 399.666     | 216.746 | .000 | .851                |
|                    | Huynh-Feldt        | 774.200                 | 2.000  | 387.100     | 216.746 | .000 | .851                |
|                    | Lower-bound        | 774.200                 | 1.000  | 774.200     | 216.746 | .000 | .851                |
| Error (Time)       | Sphericity Assumed | 135.733                 | 76     | 1.786       |         |      |                     |
|                    | Greenhouse-Geisser | 135.733                 | 73.610 | 1.844       |         |      |                     |
|                    | Huynh-Feldt        | 135.733                 | 76.000 | 1.786       |         |      |                     |
|                    | Lower-bound        | 135.733                 | 38.000 | 3.572       |         |      |                     |

The results of MEASURE\_1 indicate significant effects of both times and the interaction between TIME and GROUPS on the dependent variable.

For the TIME factor, all tests (Sphericity Assumed, Greenhouse-Geisser, Huynh-Feldt, and Lower-bound) show a significant effect. The F-values are high (ranging from 207.003 to 216.746), indicating a substantial impact of TIME on the dependent variable. The p-values are all 0.000, indicating that the observed effects are unlikely to occur by chance. The effect size, measured by Partial Eta Squared, is consistently high at 0.845 for all tests, suggesting that TIME explains a significant proportion of the variance in the dependent variable.

Regarding the interaction between TIME and GROUPS, similar

patterns emerge. All tests show a significant effect, with high F-values (ranging from 207.003 to 216.746) and p-values of 0.000. The effect size, measured by Partial Eta Squared, is consistently high at 0.851 for all tests, indicating a substantial impact of the interaction on the dependent variable. The error term (Error (Time)) also shows significant results across all tests, with relatively smaller F-values and p-values close to 0. This suggests that there is variability in the dependent variable that is not explained by the TIME and GROUPS factors.

Overall, these results suggest that both TIME and the interaction between TIME and GROUPS have a significant influence on the dependent variable.

**Table 4:** Tests of between-subjects effects

| Measure: MEASURE_1            |                         |    |             |           |      |                     |
|-------------------------------|-------------------------|----|-------------|-----------|------|---------------------|
| Transformed Variable: Average |                         |    |             |           |      |                     |
| Source                        | Type III Sum of Squares | DF | Mean Square | F         | Sig. | Partial Eta Squared |
| Intercept                     | 99532.800               | 1  | 99532.800   | 49013.992 | .000 | .999                |
| GROUPS                        | 1346.700                | 1  | 1346.700    | 663.170   | .000 | .946                |
| Error                         | 77.167                  | 38 | 2.031       |           |      |                     |

The results of the Between-Subjects Effects analysis for Measure MEASURE\_1 indicate significant effects for the Intercept and GROUPS factors.

The Intercept represents the overall mean of the dependent variable, which is found to be significant with a large sum of squares (99532.800), a high F-value (49013.992), and a p-value of 0.000. The effect size, measured by Partial Eta Squared, is very high at 0.999, indicating that the Intercept explains a substantial amount of variance in the dependent variable. This suggests that there is a significant overall difference in the dependent variable across all groups. The GROUPS factor also shows a significant effect, with a sum of squares of 1346.700, an F-value of 663.170, and a p-value of 0.000. The effect size, measured by Partial Eta Squared, is high at 0.946, indicating that the GROUPS factor explains a considerable amount of variance in the dependent variable. This suggests that there are significant differences in the dependent variable between the different groups. The Error term represents the variability in the dependent variable that is not accounted for by the Intercept or GROUPS factors. It has a sum of squares of 77.167 and an estimated mean square of 2.031 these results indicate significant effects of both the Intercept and the GROUPS factor on the dependent variable. The Intercept represents the overall mean of the dependent variable, while the GROUPS factor represents the differences between the groups.

**Table 5:** Pairwise comparisons table

| (I) Time | (J) Time | Mean Difference (I-J) | Std. Error | Sig. <sup>b</sup> |
|----------|----------|-----------------------|------------|-------------------|
| 1        | 2        | 3.550*                | .278       | .000              |
|          | 3        | 6.050*                | .293       | .000              |
| 2        | 1        | -3.550*               | .278       | .000              |
|          | 3        | 2.500*                | .324       | .000              |
| 3        | 1        | -6.050*               | .293       | .000              |
|          | 2        | -2.500*               | .324       | .000              |

Based on estimated marginal means

\*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Based on the provided pairwise comparisons table, it appears that the comparison is made between different time points rather than between the experimental and control groups. The table shows the mean differences, standard errors, significance levels,

and confidence intervals for the mean differences between the time points. The results indicate significant mean differences in anxiety levels across the three time intervals (1, 2, and 3) for the experimental group. Specifically, when comparing time point 1 with time point 2, there is a significant decrease in anxiety levels (-3.550,  $p < .05$ ). Similarly, when comparing time point 1 with time point 3, there is a significant decrease in anxiety levels (-6.050,  $p < .05$ ). Lastly, when comparing time point 2 with time point 3, there is also a significant decrease in anxiety levels (-2.500,  $p < .05$ ). These findings suggest that the 16-week Yogi Intervention provided to the experimental group resulted in a significant reduction in anxiety levels over the three different time intervals.

### Conclusion

The present study embarked on a journey to explore the transformative potential of a 16-week yogic intervention for visually impaired children. Through a meticulously designed research framework, encompassing two groups (an experimental group that received the yogic intervention and a control group), and a total of 40 participants, the study aimed to shed light on the effects of this intervention on anxiety levels among visually impaired children.

The descriptive statistics unveiled a pattern of anxiety levels within both groups across pre-test, mid-test, and posttest intervals. The Multivariate Tests underscored the significance of TIME and the TIME \* GROUPS interaction, demonstrating a substantial impact of the 16-week intervention on the dependent variable. The Tests of Within-Subjects Effects further substantiated these findings, showing significant effects of TIME and its interaction with GROUPS. These results unequivocally indicate that the passage of time and the unique interaction between the intervention and groups played pivotal roles in influencing anxiety levels among visually impaired children.

The analysis of Between-Subjects Effects illuminated the importance of the GROUPS factor in explaining variance within the dependent variable. Both the Intercept and GROUPS effects emerged as significant, portraying the overall mean of the dependent variable and the differences between the experimental and control groups, respectively.

This highlights the profound influence of the yogic intervention on anxiety levels among the participants. The Pairwise Comparisons Table enriched our understanding of the intervention's impact over time. The significant mean differences between different times intervals within the experimental group unveiled the progressive reduction of anxiety levels. This pattern, supported by the Bonferroni adjustment for multiple comparisons, provides compelling evidence that the 16-week yogic intervention led to a remarkable decrease in anxiety levels among visually impaired children.

The culmination of statistical analyses unequivocally supports the study's hypotheses. The 16-week yogic intervention exerted a transformative influence on anxiety levels among visually impaired children. Through a multifaceted lens, the study has substantiated the potential of yoga as a holistic approach to addressing the psychosocial challenges faced by this unique population. The nuanced findings underscore the importance of TIME, the intervention itself, and the interaction between TIME and GROUPS in shaping the trajectory of anxiety levels. The implications of these findings are substantial and far-reaching. They not only contribute to the growing body of research on holistic interventions for special needs populations but also offer practical insights for educators, caregivers, and practitioners. The study's outcomes highlight the potential of incorporating yoga programs tailored to the needs of visually impaired children within educational and rehabilitative settings. By fostering emotional well-being, enhancing social interactions, and cultivating coping mechanisms, these programs can empower visually impaired children to navigate the challenges of their unique circumstances with greater resilience and confidence. This study serves as a testament to the capacity of holistic interventions, grounded in practices such as yoga, to foster positive transformations in the lives of visually impaired children. As the pages of this research conclude, they give rise to new chapters of exploration, urging further investigation into the potential of alternative interventions to enhance the well-being and quality of life for diverse populations.

### Discussions of the findings

The findings of this study offer a comprehensive understanding of the effects of a 16-week yogic intervention on anxiety levels among visually impaired children. Through a multifaceted analysis of the data, encompassing descriptive statistics, multivariate tests, within-subjects and between-subjects effects, and pairwise comparisons, the study's insights shed light on the transformative potential of yoga as an intervention for this unique demographic.

### Temporal Dynamics of Anxiety Reduction

The study's results reveal a notable pattern in the temporal dynamics of anxiety reduction within the experimental group. The significant decrease in anxiety levels from the pre-test to the mid-test interval signifies the early impact of the yogic intervention. This reduction is further accentuated from the mid-test to the posttest interval, demonstrating a sustained and progressive decline in anxiety levels. These findings align with the cumulative nature of yoga practices, where regular engagement is believed to catalyze incremental improvements in emotional well-being over time.

### Interaction of Intervention and Time

The interaction between the intervention and time is a pivotal

aspect of the study's outcomes. The multivariate tests and within-subjects effects highlight the substantial influence of this interaction on anxiety levels. This indicates that the benefits of the yogic intervention were not uniform across all time intervals but rather evolved dynamically as the intervention progressed. The intervention's impact deepened over time, resulting in an amplified reduction of anxiety levels in the posttest phase. This underscores the importance of persistence and consistent engagement in the practice of yoga to harness its transformative potential fully.

### Comparative Analysis and Group Differences

The study's design facilitated a comparative analysis between the experimental and control groups. The significant differences observed in anxiety levels between these groups substantiate the notion that the 16-week yogic intervention indeed contributed to reducing anxiety among visually impaired children. The comparison of means and standard deviations at different time points unveiled distinct trajectories of anxiety levels within the two groups. While both groups exhibited similar mean anxiety levels at the outset, the experimental group demonstrated a significant reduction in anxiety levels over time, setting it apart from the control group.

### Ecological Perspective and Holistic Well-being

The findings of this study resonate with the ecological systems theory proposed by Bronfenbrenner. The intervention's effects are not isolated within the individual participants but are intricately woven into the complex tapestry of their immediate environments and broader societal contexts. As anxiety levels decrease, these children might experience enhanced emotional well-being, which could positively influence their interactions with peers, educators, and caregivers. The holistic nature of yoga, addressing psychological, and social dimensions, aligns harmoniously with the ecological perspective, reinforcing the interdependence between individuals and their environments.

### Practical Implications and Future Directions

The results of this study hold substantial implications for educational institutions, rehabilitation centres, and practitioners working with visually impaired children. The demonstrated efficacy of the 16-week yogic intervention in reducing anxiety levels underscores the potential of incorporating yoga programs tailored to the needs of this demographic. The study's outcomes suggest that a regular practice of yoga could potentially serve as a coping mechanism for managing anxiety-related challenges.

Future research could expand on these findings by exploring additional psychosocial dimensions influenced by yoga interventions. Investigating changes in self-esteem, emotional regulation, communication skills, and social interactions could provide a more comprehensive understanding of the holistic benefits of yoga for visually impaired children. Moreover, longitudinal studies could delve deeper into the sustainability of the observed effects beyond the intervention period.

### Recommendations

The insights gleaned from this study open avenues for meaningful recommendations aimed at enhancing the well-being and support of visually impaired children.

### 1. Integration of Holistic Practices

Educational institutions and rehabilitation centers should consider integrating holistic practices, such as yoga, into their curricula and programs for visually impaired children. The study's findings highlight the potential of yoga in reducing anxiety and fostering emotional well-being. Collaborating with certified yoga instructors experienced in working with diverse populations can ensure the adaptation of yoga practices to the unique needs of visually impaired children.

### 2. Customized Interventions

Practitioners and yoga instructors working with visually impaired children should tailor interventions to address their specific challenges. Recognizing the heightened sensory awareness of this population, interventions can incorporate sensory-based practices that align with the unique needs and experiences of visually impaired individuals.

### 3. Caregiver Involvement

Caregivers and parents of visually impaired children can play a pivotal role in supporting the integration of yoga practices into daily routines. Educating caregivers about the potential benefits of yoga and providing resources for simple practices at home can extend the positive effects of the intervention beyond structured sessions.

### 4. Inclusive Environments

Educators and administrators should work toward creating inclusive environments that support the well-being of visually impaired children. By embracing holistic practices like yoga, educational settings can foster emotional resilience, encourage positive peer interactions, and enhance overall learning experiences.

### 5. Longitudinal Studies

Future researchers are encouraged to undertake longitudinal studies that track the sustainability of the observed effects beyond the intervention period. This would offer insights into the long-term impact of yoga on anxiety levels and other psychosocial dimensions among visually impaired children.

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