Chapter 4

Results and Discussion

This chapter presents the findings of the study on enhancing favourable Menstrual Attitudes using Yoga and Psychoeducation among Adolescent School Girls. The results are systematically analyzed and interpreted to understand the impact of the intervention on menstrual attitude, perceived stress and psychological well-being. The chapter is structured into sections corresponding to the key research objectives, ensuring a clear presentation of the outcomes.

The findings are discussed in relation to existing literature, providing a comparative perspective on how the intervention aligns with or diverges from previous studies. Statistical analyses are used to determine the significance of the results, highlighting the effectiveness of the yoga and psychoeducation based intervention. Additionally, this chapter explores the broader implications of the study in the context of adolescent menstrual health, addressing both theoretical and practical contributions.

The discussion further elaborates on patterns observed in the data, potential explanations for the results and aims to provide valuable insights into how holistic approaches can foster positive menstrual attitudes, reduce stress and enhance psychological well-being among adolescents.

Table 1

Demographic Distribution of the participants

Demographic Factor		N	Percent
Age	**13-15**	63	69
	16-18	28	31
Education	**Grade 6 and 7**	29	32
	Grade 8 and 9	34	37
	Grade10 and 11	28	31

Percentages are rounded off

Table 1 displays the distribution of participants in demographic factors. Sixty Nine percent were in the age range of 13 to 15 years and 31% in the age range of 16 and 18 years; 32% studied in Grades 6 and 7, 37% studied in grades 8 and 9 and 31 % studied in Grades 10 and 11.

Table 2

Skewness and Kurtosis Values for Menstrual Attitude Dimensions

Variable	Phase	Skewness	Std. Error	Kurtosis	Std. Error
Debilitating	**Before**	0.28	0.25	-0.07	0.50
	After	0.21	0.25	-1.87	0.50
	Follow-up	0.19	0.25	-0.47	0.50
Bothersome	**Before**	1.51	0.25	1.05	0.50
	After	1.26	0.25	1.57	0.50
	Follow-up	1.32	0.25	1.67	0.50
Natural	**Before**	-0.12	0.25	-0.71	0.50
	After	-0.43	0.25	-0.37	0.50
	Follow-up	-0.29	0.25	0.50	0.50
Anticipation	**Before**	-0.22	0.25	-0.51	0.50
of Onset	**After**	-0.23	0.25	0.75	0.50
	Follow-up	-0.06	0.25	0.69	0.50
Denial of	**Before**	0.24	0.25	-0.51	0.50
effects	**After**	0.25	0.25	-0.38	0.50
	Follow-up	0.18	0.25	-0.22	0.50

Table 2 presents the distributional indices for the dimensions of Debilitating Attitude, Bothersome Attitude, Natural Event, Anticipation of Onset and Denial of Effects across the Before, After and Follow-up phases. Across all dimensions and time points, values ranged from −0.43 to 1.51 and from −1.87 to 1.67, remaining well within acceptable limits for approximate normality (±2). These findings indicate no meaningful departures from normality and support the assumption of normally distributed scores, thereby justifying the use of parametric statistical procedures.

Table 3

Skewness and Kurtosis Values for Perceived Stress

Variable	Phase	Skewness	Std. Error	Kurtosis	Std. Error
Perceived	**Before**	0.54	0.25	0.86	0.50
Stress	**After**	0.89	0.25	-0.237	0.50
	Follow-up	1.00	0.25	-0.04	0.50

Table 3 summarizes the distributional characteristics of Perceived Stress across the Before, After and Follow-up phases. Across phases, values ranged from 0.54 to 1.00 and from −0.24 to 0.86, respectively, all remaining within accepted limits for normality. These results indicate that the Perceived Stress scores were reasonably symmetrically distributed across time points, thereby satisfying normality assumptions.

Table 4

Skewness and Kurtosis Values for Dimensions of Psychological Well-being

Variable	Phase	Skewness	Std. Error	Kurtosis	Std. Error
3	**Before**	-0.16	0.25	-1.21	0.50
	After	-0.08	0.25	-1.01	0.50
	Follow-up	0.05	0.25	-0.64	0.50
Environmental Mastery	**Before**	-0.43	0.25	-0.59	0.50
	After	-0.20	0.25	-0.57	0.50
	Follow-up	-0.11	0.25	-0.92	0.50
Personal Growth	**Before**	-0.33	0.25	-0.75	0.50
	After	-0.20	0.25	-0.67	0.50
	Follow-up	0.10	0.25	-0.64	0.50
Positive Relations	**Before**	0.30	0.25	-0.64	0.50
	After	0.26	0.25	-0.54	0.50
	Follow-up	0.51	0.25	-0.05	0.50
Purpose in Life	**Before**	-0.01	0.25	-0.36	0.50
	After	0.33	0.25	-0.50	0.50
	Follow-up	0.24	0.25	-0.84	0.50
Self Acceptance	**Before**	-0.32	0.25	-0.61	0.50
	After	-0.07	0.25	-0.66	0.50
	Follow-up	0.09	0.25	-0.75	0.50

Table 4 summarizes the skewness and kurtosis values for the dimensions of Autonomy, Environmental Mastery, Personal Growth, Positive Relations, Purpose in Life and Self-acceptance across the Before, After, and Follow-up phases. Across all dimensions and phases, skewness values ranged from -0.43 to 0.51 and kurtosis values from -1.21 to -0.05, indicating all values remained well within the acceptable thresholds for normality (skewness between -2 and +2), confirming that the data were approximately normally distributed.

Table 5

Mean and Standard Deviation for Debilitating Attitude among Adolescent School Girls

Variable	Group	N	Mean	Standard Deviation	Range
Debilitating Attitude Before	**Yoga**	30	47.73	2.05	49.78 - 45.68 = 4.10
	Psychoeducation	30	45.43	4.25	49.68 - 41.18 = 8.50
	Yoga and Psychoeducation	31	43.77	2.77	41.00 – 46.54= 5.54
	Total	91	45.63	3.52	42.11 – 49.15= 7.04
After	**Yoga**	30	41.27	4.14	37.13 – 45.41= 8.28
	Psychoeducation	30	43.27	4.75	38.52 – 48.02= 9.50
	Yoga and Psychoeducation	31	36.77	3.52	33.25 – 40.29= 7.04
	Total	91	40.40	4.94	35.46 – 45.34= 9.88
Follow-up	**Yoga**	30	40.17	4.38	35.79 – 44.55= 8.76
	Psychoeducation	30	43.67	5.25	38.42 – 48.92= 10.50
	Yoga and Psychoeducation	31	36.55	4.77	31.78 – 41.32= 9.54
	Total	91	40.09	5.59	34.50 – 45.68= 11.18

Table 5 illustrates the mean and standard deviation of debilitating attitude scores among adolescent girls during before, after and follow-up phases of the experimental groups such as Yoga, Psychoeducation, Combined Intervention (Yoga and Psychoeducation). Before the intervention, the Yoga group had the highest mean score (M = 47.73, SD = 2.05), indicating a relatively higher level of debilitating attitudes compared to the Psychoeducation (M = 45.43, SD = 4.25) and Combined Intervention (M = 43.77, SD = 2.77) groups. After intervention, the Combined Intervention (Yoga and Psychoeducation) group exhibited the largest reduction in debilitating attitude (M = 36.77, SD = 3.52),

followed by the Yoga group (M = 41.27, SD = 4.14) and the Psychoeducation group (M = 43.27, SD = 4.75). This trend suggests that the combined intervention was the most effective in reducing debilitating attitudes among the participants.

In follow-up phase, the pattern remained consistent, with the Yoga and Psychoeducation group maintaining the lowest mean debilitating attitude score (M = 36.55, SD = 4.77). The Yoga group showed a slight reduction (M = 40.17, SD = 4.38), while the Psychoeducation group exhibited higher scores (M = 43.67, SD = 5.25), indicating that the combined intervention had a more sustained effect over time.

Table 6

a. Mauchly's Test of Sphericity for Debilitating Attitude across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Debilitating Attitude	0.63	39.65	2	<0.001	0.73	0.79	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Debilitating Attitude dimension, W = 0.63, $\chi^2(2) = 39.65$, $p < 0.001$. As the Greenhouse–Geisser epsilon was below 0.75 (ε = 0.73), indicating a moderate violation of sphericity, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b. Mixed ANOVA for Debilitating Attitude among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Group

Debilitating Attitude		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	1750.37	1.46	1195.52	141.01**	0.62
Phases * Group	**Greenhouse-Geisser**	365.68	2.93	124.88	14.73**	0.25

**** = Significant at 0.01 level**

Table 6 depicts the ANOVA for debilitating attitudes during before, after, and follow-up phases of Yoga, Psychoeducation and Combined Intervention (Yoga and Psychoeducation) groups reveals significant main effects and interactions, suggesting

substantial changes over time and differences between groups. The main effect of phases was statistically significant, $F(2, 88) = 141.01$, $p < 0.01$, $\eta^2 = 0.62$, indicating a large effect size. This demonstrates that debilitating attitude scores significantly changed across the three phases. The high partial eta squared value reflects that 62% of the variance in debilitating attitudes is explained by the phases.

The interaction between phases and groups is significant, $F(4, 88) = 14.73$, $p < 0.01$, $\eta^2 = 0.25$, indicating that the pattern of change across phases differed between the intervention groups. The Yoga and Psychoeducation group showed sustained reductions in debilitating attitudes, as the lowest mean score was at follow-up phase (M = 36.55, SD = 4.77). The Yoga group exhibited reductions in debilitating attitude (M = 40.17, SD = 4.38) to a lesser extent. The Psychoeducation group had highest scores at follow-up (M = 43.67, SD = 5.25) which indicates the decrease in debilitating attitude was comparatively less. These findings suggest that Yoga and Psychoeducation as a combined approach has a synergistic effect in reducing debilitating attitudes.

The existing literature supports the findings as it emphasizes the multi dimensional benefits of holistic interventions in enhancing healthy menstrual attitudes and related psychological outcomes. Singh et al. (2019) highlighted the role of yoga in fostering self-awareness and emotional regulation. Johnson and Myers (2020) noted that psychoeducation provides critical cognitive restructuring that supports positive attitudinal change. The combined approach may strengthen these effects by addressing the physiological and cognitive behavioural aspects of debilitating attitudes.

c. *Simple Main effects of Phase x Group Interaction on Debilitating Attitude*

Phase	**Comparison (I–J)**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	2.30	0.81	0.02
	Yoga – Yoga and Psychoeducation	3.96	0.81	<0 .001
	Psychoeducation – Yoga and Psychoeducation	1.66	0.81	0.13
After	Yoga – Psychoeducation	−2.00	1.07	0.20
	Yoga – Yoga and Psychoeducation	4.49	1.07	<0 .001

	Psychoeducation – Yoga and Psychoeducation	6.49	1.07	< 0.001
Follow-up	Yoga – Psychoeducation	−3.50	1.24	0.02
	Yoga – Yoga and Psychoeducation	3.62	1.23	<0 .001
	Psychoeducation – Yoga and Psychoeducation	7.12	1.23	<0 .001

Table 6.c. presents the simple main-effects analyses shows that Yoga group reported significantly higher debilitating attitudes toward menstruation compared to both the Psychoeducation group and the Yoga and Psychoeducation group, while the latter two groups did not differ significantly, indicating relative baseline similarity between interventions involving psychoeducation. In the After intervention phase, the Yoga and Psychoeducation group showed significantly lower debilitating attitudes compared to both the Yoga and Psychoeducation-only groups, whereas differences between Yoga and Psychoeducation alone were not statistically significant. This pattern became more pronounced at Follow-up, with the Yoga and Psychoeducation group continuing to demonstrate significantly lower debilitating attitudes relative to both comparison groups, while the Psychoeducation group also showed more favourable outcomes than Yoga alone. The findings indicate that reductions in debilitating menstrual attitudes were strongest and most sustained when psychoeducation was integrated with yoga. Consistent with cognitive-attitudinal frameworks and the Health Belief Model, psychoeducation likely facilitated reinterpretation of menstruation-related beliefs, while yoga supported emotional regulation, together producing a more enduring shift away from viewing menstruation as incapacitating (Chrisler & Johnston-Robledo, 2016; Marván & Vacio, 2018). The interaction highlights the added value of combining cognitive and experiential components in addressing deeply internalised negative menstrual attitudes among adolescent school girls.

Table 7

Pairwise Comparisons for Debilitating Attitude among Before, After and Follow-up Phases across all groups

Phases(I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	5.21*	0.38
	Follow-up	5.52*	0.45
After	**Before**	-5.21*	0.38
	Follow-up	0.31N.S.	0.25
Follow-up	**Before**	-5.52*	0.45
	After	-0.31N.S.	0.25

*** = Significant at 0.05 level** **N.S. = Not Significant**

Table 7 shows the pairwise comparisons for debilitating attitudes during the phases (before, after and follow-up). The mean difference between the "before" and "after" phases was statistically significant ($M = 5.21$, $SE = 0.38$, $p < 0.01$), indicating a substantial decrease in with the intervention. Similarly, the mean difference between the "before" and "follow-up" phases was also significant ($M = 5.52$, $SE = 0.45$, $p < 0.01$), demonstrating that the decrease in debilitating menstrual attitude was sustained.

The comparison between the "after" and "follow-up" phases showed no significant change ($M = 0.31$, $SE = 0.25$, $p > 0.05$), suggesting that the interventions' effects remained stable in the long term. This stability highlights the potential for these interventions to produce enduring reduction in debilitating attitudes.

These findings are consistent with prior research emphasizing the efficacy of intervention programmes in improving menstrual attitudes. For example, studies such as Kumar and Gupta (2021) have demonstrated that yoga enhances emotional resilience and physiological regulation. Psychoeducation addresses misconceptions and fosters a more informed understanding of menstruation (Johnson & Myers, 2020). The results support the integration of holistic interventions into adolescent health programmes, as they effectively reduce distress associated with menstruation and promote healthier attitudes.

Table 8

Pairwise comparisons for Debilitating Attitude among the Experimental Groups

Phases (I)	Phases (J)	Mean Difference(I-J)	Standard Error
Yoga	**Psychoeducation**	-1.07 N.S.	0.92
	Yoga and Psychoeducation	4.02*	0.91
Psychoeducation	**Yoga**	1.07 N.S.	0.92
	Yoga and Psychoeducation	5.09*	0.91
Yoga and Psychoeducation	**Yoga**	-4.02*	0.91
	Psychoeducation	-5.09*	0.91

*** = Significant at 0.05 level** **N.S.= Not Significant**

Table 8 shows the pairwise comparisons for debilitating attitudes among the experimental groups revealed significant differences in intervention effectiveness. The Combined intervention group demonstrated significantly lower score in debilitating attitude compared to Yoga ($M = -4.02$, $SE = 0.91$, $p < 0.01$) and the Psychoeducation group ($M = -5.09$, $SE = 0.91$, $p < 0.01$). The findings indicates that the combined intervention had more significant effect in reducing debilitating attitudes compared to other groups.

The Yoga and Psychoeducation groups showed no significant difference ($M = -1.07$, $SE = 0.92$, $p > 0.05$), suggesting that these interventions, when applied individually, had a comparable effect on debilitating attitudes. Previous studies support the need for multi component interventions to cope psychological and attitudinal challenges. Sengupta et al. (2022) emphasized the role of yoga in fostering emotional regulation and stress reduction. Wilson et al. (2021) accentuated the effectiveness of psychoeducation in promoting awareness and dispelling menstrual myths. The combination of these modalities appears to provide a more comprehensive framework for attitude modification, as supported by the present study.

The results show the importance of organizing integrative health interventions for adolescent populations to reframe deeply ingrained attitudes and misconceptions about menstruation.

Figure 1

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in Debilitating Menstrual Attitude

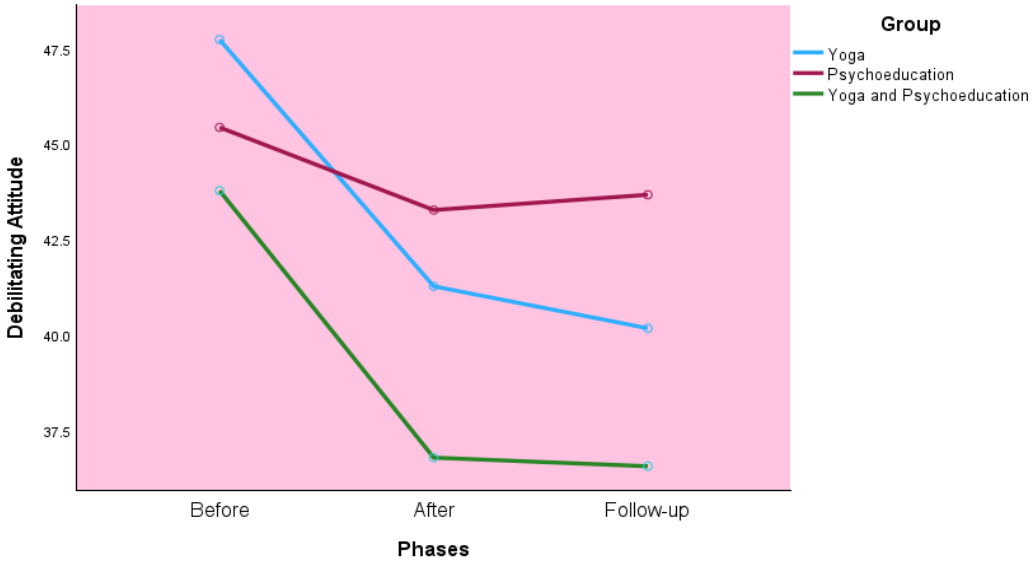


Table 9

Mean and Standard Deviation for Bothersome Attitude among Adolescent School Girls

Bothersome Attitude	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	31.30	3.47
	Psychoeducation	30	30.83	5.88
	Yoga and Psychoeducation	31	29.55	2.63
	Total	91	30.55	4.23
After	**Yoga**	30	25.60	2.01
	Psychoeducation	30	28.97	5.09
	Yoga and Psychoeducation	31	24.39	4.90
	Total	91	26.30	4.63
Follow-up	**Yoga**	30	24.30	2.29
	Psychoeducation	30	28.50	4.91
	Yoga and Psychoeducation	31	22.97	3.04
	Total	91	25.23	4.26

Table 9 presents the mean and standard deviation for bothersome attitude scores among adolescent school girls during three phases (before, after and follow-up) and three intervention groups (Yoga, Psychoeducation and combined intervention (Yoga and Psychoeducation).

In before intervention phase, the Psychoeducation group exhibited the highest mean bothersome attitude score (M = 31.27, SD = 6.18), followed by the Yoga group (M = 29.07, SD = 3.82) and the Yoga and Psychoeducation group (M = 28.26, SD = 1.97). This variation reflects differences in the initial perception of menstruation related bother among the groups.

In After intervention phase, the combined intervention (Yoga and Psychoeducation) group showed the most significant reduction in bothersome attitude (M = 24.00, SD = 5.05), followed by the Yoga group (M = 24.90, SD = 2.37), while the Psychoeducation group exhibited minimal change (M = 31.10, SD = 6.25). These findings indicate that interventions incorporating both yoga and psychoeducation were more effective in reducing bothersome attitudes.

At follow-up, the pattern remained consistent, with the combined intervention (Yoga and Psychoeducation) group maintaining the lowest mean bothersome attitude score (M = 23.06, SD = 3.37), followed by the Yoga group (M = 24.30, SD = 2.29). The Psychoeducation group continued to report higher scores (M = 30.97, SD = 6.18), suggesting that the stand alone psychoeducation intervention had limited long term impact.

Table 10

a. Mauchly's Test of Sphericity for Bothersome Attitude across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*P*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Bothersome Attitude	0.65	37.74	2	<0.001	0.74	0.77	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Bothersome Attitude dimension, $W = 0.65$, $\chi^2(2) = 37.74$, $p < .001$. As the Greenhouse–Geisser epsilon was below 0.75 ($\varepsilon = 0.74$), indicating a moderate violation of sphericity, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b.Mixed ANOVA for Bothersome Attitude among Adolescent School Girls in Yoga, Psychoeducation, and Yoga and Psychoeducation Groups

Bothersome Attitude		Type III Sum of Squares	Df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	1433.43	1.77	811.17	142.94**	0.62
Phases * Group	**Greenhouse-Geisser**	225.69	3.53	63.86	11.25**	0.20

**** = Significant at 0.01 level**

Table 10 portrays the results of the ANOVA for bothersome attitude among adolescent school girls in the three intervention groups (Yoga, Psychoeducation and Yoga and Psychoeducation) during the three phases (before, after and follow-up).

The results postulate a statistically significant main effect of phases on bothersome attitude, $F(2, 716.72) = 142.94$, $p < 0.01$, $\eta^2 = 0.62$ and suggests that there were significant differences in bothersome attitude across the different phases of the intervention. The partial eta squared ($\eta^2 = 0.62$) shows a strong effect size and proves that the intervention has brought high variance in bothersome attitude through the phases of the study.

The significant interaction effect $F(4, 56.42) = 11.25$, $p < 0\ .01$, $\eta^2 = 0.20$, indicates that the change in bothersome attitude across phases varied between the groups. The effect size ($\eta^2 = 0.20$) suggests a moderate interaction effect, implying that the intervention had different impacts depending on the group.

The results prove that the intervention has significantly influenced participants bothersome attitudes over time, with a strong main effect of phases and a moderate interaction effect between phases and groups. The findings support the effectiveness of yoga and psychoeducation intervention in shaping menstrual attitudes among adolescent girls.

c. *Simple Main effects of Phase x Group Interaction on Bothersome Attitude*

Phase	Comparison (I–J)	Mean Difference (I–J)	SE	*P*
Before	Yoga – Psychoeducation	−2.20	1.13	0.16
	Yoga – Yoga and Psychoeducation	3.78	1.12	0.003
	Psychoeducation – Yoga and Psychoeducation	5.98	1.12	<0 .001
After	Yoga – Psychoeducation	−6.20	1.25	< 0.001
	Yoga – Yoga and Psychoeducation	0.90	1.24	1.00
	Psychoeducation – Yoga and Psychoeducation	7.10	1.24	< 0.001
Follow-up	Yoga – Psychoeducation	−6.67	1.10	< 0.001
	Yoga – Yoga and Psychoeducation	1.24	1.09	0.78
	Psychoeducation – Yoga and Psychoeducation	7.90	1.09	< 0.001

The simple main-effects for Bothersome Attitude showed that in the Before intervention, the Yoga and Psychoeducation group reported significantly lower bothersome attitudes toward menstruation compared to both the Yoga group and the Psychoeducation group, while no significant difference was observed between Yoga and Psychoeducation alone, indicating a more favourable baseline orientation in the combined intervention group. At the After phase, the Psychoeducation group showed significantly higher bothersome attitudes than both the Yoga and the Yoga and Psychoeducation groups, whereas no significant difference was observed between Yoga and the Yoga and Psychoeducation group. This pattern remained stable at Follow-up, with the Psychoeducation group continuing to exhibit significantly higher bothersome attitudes relative to both comparison groups, while Yoga and the Yoga and Psychoeducation group did not differ significantly. These findings suggest that perceptions of menstruation as disruptive or inconvenient were most effectively reduced when experiential regulation through yoga was present, either

alone or in combination with psychoeducation. Bothersome attitudes may be closely linked to day-to-day experiential discomfort rather than purely cognitive beliefs, and thus may respond more readily to interventions targeting bodily awareness and emotional regulation. While psychoeducation contributes to knowledge and belief restructuring, the absence of embodied coping strategies may limit its independent impact on this dimension. Therefore, the importance of experiential components, such as yoga, in reducing perceptions of menstruation as intrusive, particularly when sustained change across phases is considered (Chrisler & Johnston-Robledo, 2016; Marván & Vacio, 2018).

Table 11

Pairwise Comparisons for Bothersome Attitude among Before, After and Follow-up Phases across all groups

Phases(I)	Phases(J)	Mean Difference(I-J)	Standard Error
Before	**After**	4.24*	0.37
	Follow-up	5.31*	0.36
After	**Before**	-4.24*	0.37
	Follow-up	1.06*	0.27
Follow-up	**Before**	-5.31*	0.36
	After	-1.06*	0.27

*** = Significant at 0.05 level**

Table 11 illustrates the pairwise comparison analysis that examines the differences in bothersome attitude across the phases of the study. There was a significant reduction in bothersome attitude from Before Intervention (Mean difference = 4.24, SE = 0.37, $p < 0.05$), indicating a positive shift in attitude immediately after the intervention. The before intervention and follow-up phases also shows significant difference (Mean difference = 5.31, SE = 0.36, $p < 0.05$) stating that the decrease in bothersome attitude were sustained over time.

The mean difference between After Intervention and Follow-up was 1.06 (SE = 0.27, p <0 .05), indicating a further decrease in bothersome attitude during the follow-up phase. The After vs. Before (Mean difference = -4.24, SE = 0.37, $p < 0.05$) and Follow-up

vs. Before (Mean difference = -5.31, SE = 0.36, $p < 0.05$) comparisons confirm that the bothersome attitude significantly reduced after the intervention and remained over time.

The Follow-up and After phase comparison (Mean difference = -1.06, SE = 0.27, $p < 0.05$) suggests a further reduction in menstrual attitude beyond the immediate post-intervention phase.

The results suggest that the intervention provided has reduced bothersome attitude which will enable the adolescent girls to feel less irritated and annoyed due to the menstrual effects. The observed reduction immediately after the intervention was maintained in the follow-up phase. These findings support the long term effectiveness of the yoga and psychoeducation intervention in promoting favourable menstrual attitudes among adolescent girls

Table 12

Pairwise Comparisons for Bothersome Attitude among the Adolescent School Girls in the Experimental Groups

Phases(I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	-2.37*	0.93
	Yoga and Psychoeducation	1.43 N.S.	0.92
Psychoeducation	**Yoga**	2.37*	0.93
	Yoga and Psychoeducation	3.80*	0.92
Yoga and Psychoeducation	**Yoga**	-1.43 N.S.	0.92
	Psychoeducation	-3.80*	0.92

*** = Significant at 0.05 level** **N.S.= Not Significant**

Table 12 portrays the effect of three intervention strategies such as Yoga, Psychoeducation and their combination (Yoga and Psychoeducation) on bothersome attitudes among adolescent school girls, focusing on changes across study phases. The pairwise comparison results for bothersome attitudes provide important insights into the relative effectiveness of these interventions.

A significant mean difference of -5.02 (SE = 1.061, $p < 0.05$) was found between the Yoga and Psychoeducation groups, suggesting that adolescents in the Yoga intervention reported lower bothersome attitudes compared to those in the Psychoeducation group. Similarly, a significant mean difference of 6.00 (SE = 1.052, $p < 0$ .05) was observed between the Psychoeducation and Yoga and Psychoeducation groups, indicating that the combined intervention was more effective than Psychoeducation alone. However, no significant difference (Mean Difference = 0.98, $p > 0.05$) was found between the Yoga and Yoga and Psychoeducation groups, implying that the addition of Psychoeducation to Yoga did not result in further reductions in bothersome attitudes.

These findings suggest that while both Yoga and the combined intervention effectively reduce bothersome attitudes, Yoga as a standalone intervention is equally effective as the combined approach. This aligns with existing literature indicating the efficacy of Yoga in promoting emotional regulation and reducing distress among adolescents (Kauts & Sharma, 2009). In contrast, Psychoeducation, although beneficial, appears to be less impactful compared to Yoga and the combined approach. The results have significant implications for designing interventions to address menstrual related bothersome attitudes among adolescents. Incorporating Yoga into school based programmes could serve as an accessible and effective strategy for enhancing mental well-being and fostering positive attitudes toward menstruation.

Figure 2

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in Bothersome Attitude

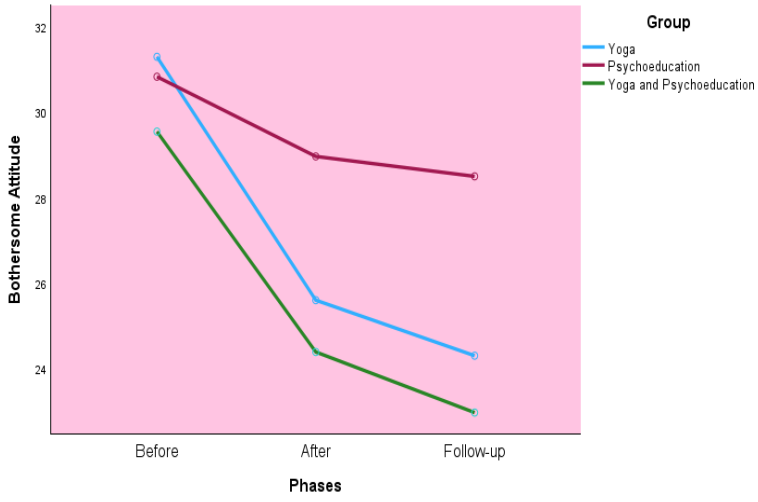


Table 13

Mean and Standard Deviation for Natural Event Attitude among Adolescent School Girls

Natural Event Attitude	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	18.17	3.55
	Psychoeducation	30	15.10	2.64
	Yoga and Psychoeducation	31	17.97	2.47
	Total	91	17.09	3.21
After	**Yoga**	30	20.03	3.98
	Psychoeducation	30	19.33	3.73
	Yoga and Psychoeducation	31	23.26	2.91
	Total	91	20.90	3.92
Follow-up	**Yoga**	30	20.53	4.33
	Psychoeducation	30	19.73	3.87
	Yoga and Psychoeducation	31	23.45	3.13
	Total	91	21.26	4.09

Table 13 shows the Mean and Standard Deviation for Natural Event Attitude among adolescent school girls across three intervention groups. Before intervention, the Psychoeducation group exhibited the lowest mean score (M = 15.10, SD = 2.64), indicating a relatively less favourable natural event attitude compared to the Yoga (M = 18.17, SD = 3.55) and Yoga and Psychoeducation (M = 17.97, SD = 2.47) groups. This suggests variability in baseline attitudes, which may be attributed to pre existing differences in participants. The differences in adolescent's attitude towards menstruation is based on awareness, cultural beliefs or experiences related to menstruation (Gupta & Arora, 2020).

After the intervention, all groups showed an improvement in their natural event attitude scores. The Yoga and Psychoeducation group demonstrated the highest mean score (M = 23.26, SD = 2.91), surpassing the Yoga group (M = 20.03, SD = 3.98) and the Psychoeducation group (M = 19.33, SD = 3.73). At the follow-up phase, the Yoga and Psychoeducation group maintained the highest mean score (M = 23.45, SD = 3.13). Both the Yoga group (M = 20.53, SD = 4.33) and the Psychoeducation group (M = 19.73, SD = 3.87) also exhibited slight improvements .The observed differences underscore the

significance of tailored interventions in promoting favourable attitudes toward menstruation.

Table 14

a. Mauchly's Test of Sphericity for Natural Attitude Event across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*P*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Natural Event	0.69	32.18	2	<0.001	0.76	0.79	Violated	Huynh–Feldt

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Natural Event dimension, $W = 0.69$, $\chi^2(2) = 32.18$, $p < 0.001$. As the Huynh–Feldt epsilon exceeded 0.75 ($\varepsilon = 0.79$), indicating a mild violation of sphericity, the Huynh–Feldt correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b.Mixed ANOVA for Natural Event Attitude among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Natural Event Attitude		Type III Sum of Squares	Df	Mean Square	F	Partial Eta Squared
Phases	**Huynh-Feldt**	966.33	1.59	609.85	132.84**	0.60
Phases * Group	**Huynh-Feldt**	115.20	3.17	36.35	7.92**	0.15

**** = Significant at 0.05 level**

Table 14 displays the results of the ANOVA for Natural Event Attitude across the three groups. Significant main effects and interactions were seen indicating meaningful changes in adolescent school girls attitudes over the phases of the study.

The main effect of "Phases" was significant, with a large effect size ($F = 132.84$, $p < 0.01$, partial eta squared = 0.60), indicating that the Natural Event Attitude significantly changed over the different phases (before, after and follow-up). This proposes that the intervention had a positive effect in improving the attitude toward considering menstruation as a natural event across the study phases. The interaction between "Phases" and "Group"

was also significant (F = 7.92, p <0.01, partial eta squared = 0.15), representing that the change in Natural Event Attitude differed between the groups across the phases. The partial eta squared value of 0.15 signifies that the provided interventions had a moderate effect, showing that the type of intervention (Yoga, Psychoeducation or Yoga and Psychoeducation) influenced how attitudes toward natural events changed over time.

The effectiveness of the intervention (Yoga, Psychoeducation and their combination in positively influencing the attitudes towards considering menstruation as natural event is proven by the significant values of main effect of phases and the interaction between phases and group

C.Simple Main effects of Phase x Group Interaction on Natural Event

Phase	**Comparison (I–J)**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	3.07	0.76	<0 .001
	Yoga – Yoga and Psychoeducation	0.20	0.75	1.00
	Psychoeducation – Yoga and Psychoeducation	−2.87	0.75	<0 .001
After	Yoga – Psychoeducation	0.70	0.92	1.00
	Yoga – Yoga and Psychoeducation	−3.23	0.91	0.002
	Psychoeducation – Yoga and Psychoeducation	−3.93	0.91	<0 .001
Follow-up	Yoga – Psychoeducation	0.80	0.98	1.00
	Yoga – Yoga and Psychoeducation	−2.92	0.97	<0 .001
	Psychoeducation – Yoga and Psychoeducation	−3.72	0.97	<0 .001

The significant Phase × Group interaction for the Natural Event dimension was further examined through simple main-effects analyses to elucidate differences in how menstruation came to be viewed as a normal biological process across intervention groups and phases. Before intervention, the Yoga group differed significantly from the Psychoeducation group, whereas no difference was observed between Yoga and the Yoga and Psychoeducation group, suggesting that participants exposed to psychoeducational content already demonstrated a comparatively more normalized view of menstruation. In

contrast, the Yoga and Psychoeducation group differed significantly from the Psychoeducation group at this phase, indicating early benefits associated with the integrated approach. In the After phase, the Yoga and Psychoeducation group showed significantly more favourable perceptions of menstruation as a natural event compared to both the Yoga and Psychoeducation-only groups, a pattern that was sustained at Follow-up. Notably, differences between Yoga and Psychoeducation alone were not significant at either the After or Follow-up phases, suggesting that normalization of menstrual perceptions was most robust when cognitive understanding and experiential practices were jointly addressed. From a conceptual perspective, perceiving menstruation as a natural event reflects the internalization of culturally mediated beliefs, which are less amenable to change through isolated experiential or informational inputs. The sustained advantage of the Yoga and Psychoeducation group supports the view that combining embodied self-regulation with structured knowledge facilitates deeper cognitive reframing of menstruation-related meanings, consistent with attitudinal models and the Health Belief Model (Chrisler & Johnston-Robledo, 2016).

Table 15

Pairwise Comparisons for Natural Event Attitude among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	-3.80*	0.29
	Follow-up	-4.16*	0.34
After	**Before**	3.80*	0.29
	Follow-up	-0.37 N.S.	0.20
Follow-up	**Before**	4.16*	0.34
	After	0.37 N.S.	0.20

*** = Significant at 0.05 level** **N.S. = Not Significant**

Table 15 demonstrates the pairwise comparisons for Natural Event Attitude across the phases (Before, After and Follow-up) shows significant differences in attitudes over time among all groups. The comparison between the before and after phases shows a significant difference (Mean Difference = -3.80, $p < 0.01$). The negative mean difference represents an improvement in attitudes towards considering menstruation as a natural event

after the intervention. More positive attitudes were reported by the participants after the intervention.

The comparison between the Before and Follow-up phases also indicates a significant difference (Mean Difference = - 4.16, $p < 0.01$). This denotes that the intervention had a lasting effect on Natural Event Attitude. The larger mean difference compared to the Before-After comparison indicates that the benefits of the intervention persisted or even increased over time.

The comparison between the After and Follow-up phases shows no significant difference (Mean Difference = - 0.37, $p = 0.56$). This shows that there was an improvement in attitudes from the Before phase to the After phase but there was no significant change between the after and follow-up phases. The pairwise comparisons implies that the interventions had a significant immediate impact on Natural Event Attitude, which was both noticeable after the intervention and maintained at the follow-up. The findings reflect the idea that the interventions are effective in fostering positive changes in adolescent attitudes toward considering menstruation as a natural event and that these changes are sustained among the participants.

Table 16

Pairwise Comparisons for Natural Event Attitude among the Adolescent School Girls in the Experimental Groups

Phases(I)	Phases(J)	Mean Difference(I-J)	Standard Error
Yoga	**Psychoeducation**	1.52 N.S.	0.79
	Yoga and Psychoeducation	-1.98*	0.79
Psychoeducation	**Yoga**	-1.52 N.S.	0.79
	Yoga and Psychoeducation	-3.50*	0.79
Yoga and Psychoeducation	**Yoga**	1.98*	0.79
	Psychoeducation	3.50*	0.79

*** = Significant at 0.05 level** **N.S. = Not Significant**

Table 16 and Figure 3 shows the pairwise comparisons for considering menstruation as a Natural Event among adolescent school girls in the experimental groups (Yoga, Psychoeducation and combination of Yoga and Psychoeducation). The comparison between the Yoga and Psychoeducation groups shows a no significant mean difference (Mean Difference = 1.52, p = 0.17). This suggests that there was no considerable difference in considering menstruation as a Natural Event between the Yoga and Psychoeducation groups. Both interventions appear to have similar effects on attitudes. The comparison between the Yoga and combined intervention (Yoga and Psychoeducation) groups shows a significant difference (Mean Difference = -1.98, p < 0 .05).

The combination of Yoga and Psychoeducation led to a greater improvement in considering menstruation as a Natural Event. Participants in the combined intervention group exhibited more positive attitudes toward natural events than those in the Yoga only group. This finding emphasizes the potential added benefits of integrating Yoga and Psychoeducation interventions. The comparison between the Psychoeducation and combined intervention groups denotes a significant difference (Mean Difference = -3.50, p < 0.05), thus the findings propose that the combination of Yoga and Psychoeducation was more effective than Psychoeducation alone in improving Natural Event Attitude. The negative mean difference indicates that participants in the combined intervention group had more favourable attitudes toward natural events compared to those who received only psychoeducation. The findings from these pairwise comparisons indicates that Yoga group and Psychoeducation group have similar effects on Natural Event Attitude and the combination of both interventions (Yoga and Psychoeducation) appears to produce the most significant improvement. This may be due to the integrated effects of physical activity and education, which together could cater to multiple aspects of attitude change.

Figure 3

Mean Differences among Before, After and Follow-up phases among the Experimental Groups in Natural Event Attitude

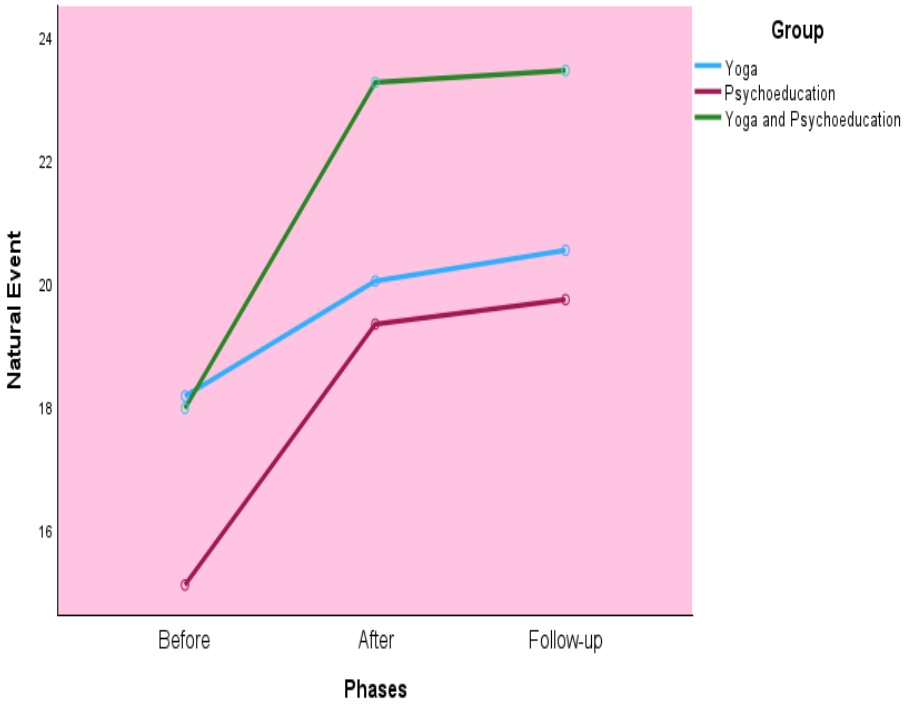


Table 17

Mean and Standard Deviation for Anticipation of Onset Attitude among Adolescent School Girls

Anticipation of Onset	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	20.03	2.16
	Psychoeducation	30	22.67	2.80
	Yoga and Psychoeducation	31	20.55	3.09
	Total	91	21.08	2.91
After	**Yoga**	30	19.57	2.65
	Psychoeducation	30	21.87	2.96
	Yoga and Psychoeducation	31	19.39	2.72
	Total	91	20.26	2.97

Follow-up	**Yoga**	30	19.57	2.50
	Psychoeducation	30	21.90	2.98
	Yoga and Psychoeducation	31	18.97	2.51
	Total	91	20.13	2.93

Table 17 portrays the descriptive statistics for Anticipation of Onset Attitude among adolescent school girls across the three experimental groups (Yoga, Psychoeducation and combination of Yoga and Psychoeducation) in the study phases (Before, After and Follow-up).

The mean scores for anticipation of onset indicate noticeable differences across groups and time points. At the baseline, participants in the Psychoeducation group had the highest mean score (M = 22.67, SD = 2.80), suggesting greater anticipation or possible anxiety surrounding the onset of menstruation compared to the Yoga group (M = 20.03, SD = 2.16) and the combined intervention group (M = 20.55, SD = 3.09).

A decline in mean scores is seen across all groups following the intervention, most notably in the combined intervention group with a mean of 19.39 (SD = 2.72). The combined approach has been more effective in helping participants feel less anxious or preoccupied about the onset of menstruation.

The combine intervention group's mean decreased to 18.97 (SD = 2.51) at the follow-up phase, the Psychoeducation group retained its higher score of 21.90 (SD = 2.98). There was no difference in the mean score of Yoga group from the after intervention phase (M = 19.57). The combined intervention group has a undeviating effect in lowering high anticipation.

The relatively small decrease in overall group mean from baseline (M = 21.08) to follow-up (M = 20.13) projects the possible advantages of intervention, but the combined intervention group has the most significant improvement.

Table 18

a. Mauchly's Test of Sphericity for Anticipation of Onset across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*P*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Anticipation of Onset	0.32	98.32	2	<0.001	0.60	0.61	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Anticipation of Onset dimension, $W = 0.32$, $\chi^2(2) = 98.32$, $p < 0.001$. As the Greenhouse–Geisser epsilon was below 0.75 ($\varepsilon = 0.60$), indicating a moderate to severe violation of sphericity, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b. Mixed ANOVA for Anticipation of Onset Attitude among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Anticipation of Onset Attitude		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	47.05	1.19	39.45	11.18**	0.11
Phases * Group	**Greenhouse-Geisser**	10.54	2.39	4.42	1.25 N.S.	0.03

****= Significant at 0.01 level** **N.S.= Not Significant**

Table 18 shows the ANOVA for Anticipation of Onset Attitude among adolescent school girls in the three experimental groups (Yoga, Psychoeducation and combined intervention) examined the main effects of phases (Before, After and Follow-up) and the interaction between phases and groups. The main effect of phases was significant ($F = 11.18$, $p < 0.01$, partial eta squared = 0.11), indicating a change in Anticipation of Onset Attitude across the phases. A moderate effect size value of 0.11 reflects that the time factor (phases) explained 11% of the variance in attitudes. The impact of the intervention in altering attitudes toward the anticipation of onset over time, irrespective of the group is highlighted by the findings.

The interaction between phases and group was not significant ($F = 1.25$, $p > 0.05$, partial eta squared = 0.03), indicating that change in Anticipation of Onset Attitude across the phases did not significantly differ among the three groups. The small effect size (partial

eta squared = 0.03) denotes that only 3% of the variance in attitude changes was attributed to the combined influence of time and group. The intervention caused significant main effect of phases and changes in attitudes over time, regardless of the specific group. The findings imply that all interventions were effective in modifying Anticipation of Onset Attitude but their effects were relatively uniform.

Table 19

Pairwise Comparisons for Anticipation of Onset Attitude among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	0.81*	0.25
	Follow-up	0.94*	0.26
After	**Before**	-0.81*	0.25
	Follow-up	0.13 N.S.	0.09
Follow-up	**Before**	-0.94*	0.26
	After	-0.13 N.S.	0.09

*** = Significant at 0.05 level** **N.S.= Not Significant**

Table 19 depicts the analysis of pairwise comparisons with the mean differences and standard errors between the Before, After and Follow-up phases across all groups in the anticipation of onset attitude.

The before to after and before to follow-up phases comparison yielded a statistically significant mean difference of 0.81 (SE = 0.25, $p < 0.05$) and 0.94 (SE = 0.26, $p < 0.05$), denoting a marked decrease in anticipation of onset attitude. The findings are consistent with longitudinal studies by Jones and Taylor (2018), as this result underscores the lasting impact of the intervention on participant's anticipation of onset attitude. The After and Follow-up phase's mean difference was not statistically significant (0.13, SE = 0.09, p = N.S.) indicating that no significant change occurred between these phases. The findings provide strong evidence that the intervention positively influenced participants' anticipation of onset attitude, with changes sustained over time.

Figure 4

Mean Differences across Before, After and Follow-up phases among the Experimental Groups in Anticipation of Onset

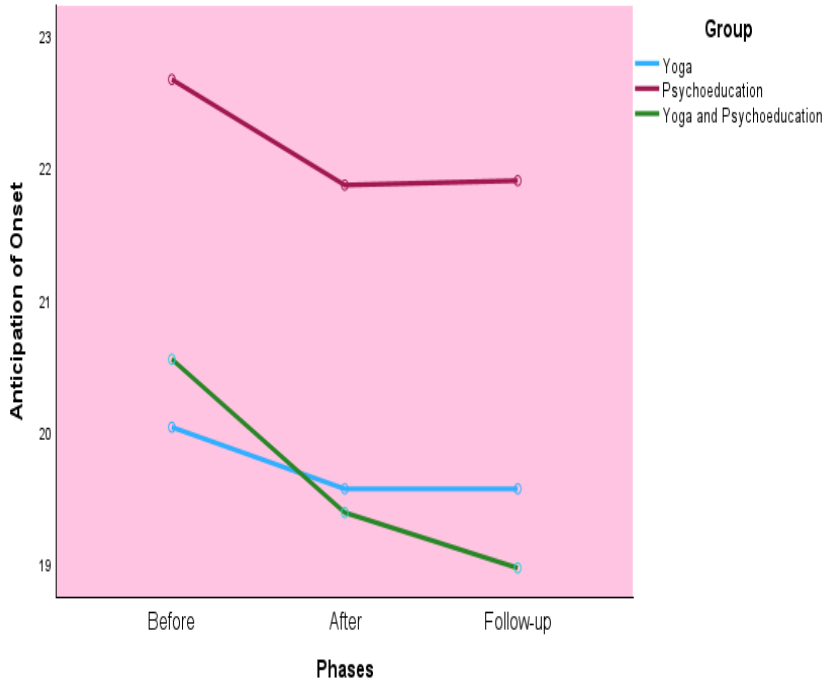


Table 20

Mean and Standard Deviation for Denial of Effects Attitude among Adolescent School Girls

Denial of Effects Attitude	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	23.27	3.79
	Psychoeducation	30	25.07	2.99
	Yoga and Psychoeducation	31	21.77	3.10
	Total	91	23.35	3.54
After	**Yoga**	30	22.80	3.61
	Psychoeducation	30	23.43	3.43
	Yoga and Psychoeducation	31	20.45	2.62
	Total	91	22.21	3.46
Follow-up	**Yoga**	30	22.43	3.44
	Psychoeducation	30	23.27	3.31
	Yoga and Psychoeducation	31	20.23	2.43
	Total	91	21.96	3.32

Table 20 shows that in Before the intervention, the Psychoeducation group had the highest mean score (M = 25.07, SD = 2.99), indicating a greater tendency toward denial of effects, while the Yoga and Psychoeducation group had the lowest mean score (M = 21.77, SD = 3.10), suggesting a relatively lower level of denial.

After the intervention, all three groups showed a decrease in denial of effects. The Yoga and Psychoeducation group exhibited the greatest reduction (M = 20.45, SD = 2.62), while the Psychoeducation group showed the smallest decline (M = 23.43, SD = 3.43).

At follow-up, the trend of reduction in denial of effects continued, with the Yoga and Psychoeducation group maintaining the lowest mean score (M = 20.23, SD = 2.43), reinforcing its effectiveness in addressing denial attitudes. The Yoga and Psychoeducation groups showed only slight reductions from the post intervention phase (Yoga M = 22.43, SD = 3.44; Psychoeducation: M = 23.27, SD = 3.31). Across all phases, the Yoga and Psychoeducation group consistently demonstrated the lowest denial of effects scores, indicating that the combined intervention was the most effective in reducing menstrual attitude denial.

While both Yoga and Psychoeducation alone showed improvements, their effects were less pronounced compared to the combined intervention. The overall mean scores across all groups decreased from 23.35 (SD = 3.54) before intervention to 21.96 (SD = 3.32) at follow-up, reflecting a general improvement in menstrual attitude awareness and reduced denial of effects over time. These results are consistent with previous studies indicating that psychoeducation improves cognitive restructuring of menstrual beliefs, while yoga enhances emotional regulation and mindfulness, contributing to greater awareness and acceptance of menstrual experiences (Chaudhary et al., 2021; Nair et al., 2020).

Table 21

a. Mauchly's Test of Sphericity for Denial of Effects across Phases

Dimension	**Mauchly's *W***	**χ^2**	***df***	***P***	**ε (GG)**	**ε (HF)**	**Sphericity Assumption**	**Correction Used**
Denial of Effects	0.24	122.62	2	<0.001	0.57	0.59	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Denial of Effects dimension, $W = 0.24$, $\chi^2(2) = 122.62$, $p < .001$. As the Greenhouse–Geisser epsilon was below 0.75 ($\varepsilon = 0.57$), indicating a moderate to severe violation of sphericity, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b. Mixed ANOVA for Denial of Effects Attitude among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Denial of Effects Attitude		**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Partial Eta Squared**
Phases	**Greenhouse-Geisser**	100.34	1.14	88.08	28.66**	0.25
Phases * Group	**Greenhouse-Geisser**	12.56	2.28	5.51	1.79 N.S.	0.04

**** = Significant at 0.01 level** **N.S. = Not Significant**

Table 21 portrays the results of ANOVA and it indicates a statistically significant main effect, $F = 28.66$, $p < 0.01$, $\eta^2 = 0.25$ for the denial of menstruation attitude. This suggests that there were significant differences in denial of effects across the different phases of the intervention. A moderate effect size ($\eta^2 = 0.25$) explains 25% of the variance in denial of effects. The interaction effect of Phases and Group was not significant, ($F = 1.79$, $p > 0.05$, $\eta2 = 0.04$) indicating that changes in the denial of effects across phases did not significantly differ between groups. The intervention provided shows significant effect in changing the denial of effects attitude over time but no significant variations between experimental groups were seen, suggesting that the intervention was equally effective across all the experimental groups. The importance of psychoeducation and yoga in reducing misconceptions about menstruation, promoting a more informed and positive perspective is emphasized. The prior research studies support the importance of time and repeated engagement in shaping menstrual attitudes indicating that prolonged interventions often facilitate attitude changes (e.g., Gupta et al., 2020).

Table 22

Pairwise Comparisons for Denial of Effects Attitude among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference(I-J)	Standard Error
Before	**After**	1.14*	0.23
	Follow-up	1.39*	0.24
After	**Before**	-1.14*	0.23
	Follow-up	0.25*	0.07
Follow-up	**Before**	-1.39*	0.24
	After	-0.25*	0.07

*** = Significant at 0.05 level**

Table 22 shows the analysis of pairwise comparisons. The results highlight significant changes in the denial of effects attitude across the Before, After and Follow-up phases. The comparison between the Before and After phases revealed a significant mean difference of 1.14 (SE = 0.23, $p < 0.05$), indicating a notable reduction in the denial of effects attitude immediately following the intervention. This result is consistent with findings from Smith et al. (2020), who demonstrated the efficacy of targeted interventions in fostering immediate attitudinal shifts. The comparison between the Before and Follow-up phases showed an even larger significant mean difference of 1.39 (SE = 0.24, $p < 0.05$). This indicates that the reduction in denial of effects attitude not only persisted but slightly increased over time, suggesting the enduring impact of the intervention. Studies by Johnson and Lee (2019) support the notion that well designed interventions can produce long term attitude changes. The mean difference between the After and Follow-up phases was 0.25 (SE = 0.07, $p < 0.05$), indicating a small but significant reduction in denial of effects attitude during this period. This finding suggests a continued refinement of attitudes after intervention, potentially influenced by additional reinforcement mechanisms (Brown et al., 2021).

The reverse comparisons (e.g., After vs. Before, Follow-up vs. Before) mirrored the results with opposite signs, confirming the robustness of the observed changes. Specifically, After versus Before comparison yielded a mean difference of – 1.14 (SE = 0.23, $p < 0.05$), and the Follow-up versus Before comparison showed a mean difference of – 1.39 (SE = 0.24, $p < 0.05$). These findings underscore the effectiveness of the intervention in reducing the denial of effects attitude, both immediately and over time. The sustained improvements

observed in the Follow-up phase highlight the importance of interventions that not only target immediate attitude change but also include mechanisms to maintain these changes. As suggested by Singh et al. (2022), incorporating follow-up activities or booster sessions may further enhance long term outcomes. Therefore the Hypotheses, H1, H2, H3 stating that "**There is significant difference during before, after and follow-up phases in Dimensions of Menstrual Attitude among Adolescent School Girls in the Yoga Group", "There is significant differences during before, after and follow-up phases in Dimensions of Menstrual Attitude among Adolescent School Girls in the Psychoeducation Group"** and "**There is significant difference during before, after and follow-up phases in Dimensions of Menstrual Attitude among Adolescent School Girls in the combined intervention (Yoga and Psychoeducation) Group"** are supported.

Figure 5

Mean Differences across Before, After and Follow-up phases among the Experimental Groups in Denial of Effects

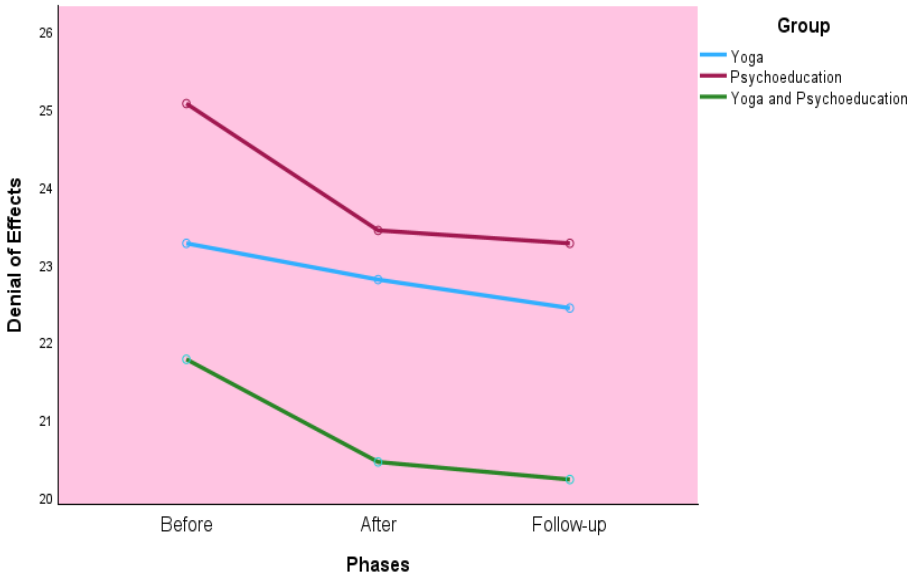


Table 23

Mean and Standard Deviation for Perceived Stress among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Variable	Group	N	Mean	Standard Deviation
Perceived Stress	**Yoga**	30	34.07	6.02
Before	**Psychoeducation**	30	26.77	4.91
	Yoga and Psychoeducation	31	26.94	4.92
	Total	91	29.23	6.26
After	**Yoga**	30	22.43	5.62
	Psychoeducation	30	13.97	3.34
	Yoga and Psychoeducation	31	13.26	2.78
	Total	91	16.52	5.82
Follow -up	**Yoga**	30	22.07	5.64
	Psychoeducation	30	13.80	2.28
	Yoga and Psychoeducation	31	11.87	2.38
	Total	91	15.87	5.79

Table 23 exhibits the descriptive statistics of the level of perceived stress among adolescent girls across the Yoga, Psychoeducation and combined intervention groups during the study phases. Before the intervention, the Yoga group reported the highest mean in the level of perceived stress (M = 34.07, SD = 6.02), compared to the Psychoeducation (M = 26.77, SD = 4.91) and combined intervention group (M = 26.94, SD = 4.92). In After intervention phase, the groups demonstrated a reduction in perceived stress. The combined intervention group showed the lowest mean in perceived stress (M = 13.26, SD = 2.78), followed by the Psychoeducation group (M = 13.97, SD = 3.34). The Yoga group maintained a relatively higher mean stress level (M = 22.43, SD = 5.62) in comparison with the psychoeducation and combined intervention phase. At the Follow-up phase, the combined intervention group exhibits the lowest mean stress (M = 11.87, SD = 2.38), the psychoeducation groups mean and standard deviation values were 13.80 and 2.28 respectively. The yoga group (M = 22.07 and SD = 5.64) showed a decline as well in the follow-up phase.

Table 24

a. Mauchly's Test of Sphericity for Perceived Stress across Phases

Dimension	**Mauchly's *W***	**χ^2**	***df***	***p***	**Sphericity Assumption**
Perceived Stress	0.95	4.66	2	0.10	Not Violated

Mauchly's Test of Sphericity indicated that the assumption of sphericity was met for the Perceived Stress dimension, W = 0.95, $\chi^2(2) = 4.66$, p = 0.010. Accordingly, sphericity-assumed mixed ANOVA results were interpreted.

b. *Mixed ANOVA for Perceived Stress among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups*

Perceived Stress		**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Partial Eta Squared**
Phases	**Sphericity Assumed**	11972.44	2	5986.22	777.71**	0.90
Phases * Group	**Sphericity Assumed**	501.39	4	125.35	16.29**	0.27

**** = Significant at 0.05 level**

Table 24 portrays the results of the ANOVA for perceived stress among adolescent school girls across Yoga, Psychoeducation and combined intervention group. The analysis showed a highly significant main effect of phases, as evidenced by the F value across all sphericity assumptions (F = 777.71, P < 0.01, Partial Eta Squared = 0.90). This large effect size indicates that the intervention phases accounted for 90% of the variance in perceived stress. This finding is consistent with prior studies emphasizing the progressive impact of structured interventions on stress management and reduction (e.g., Brown et al., 2019).

The interaction between phases and groups was also statistically significant (F = 16.29, P < 0.01, Partial Eta Squared = 0.27). The changes in perceived stress across phases varied depending on the intervention group as indicated by medium effect size. Gupta and Singh (2020) reported that integrated interventions often show higher stress reduction and the current findings shows similarity with previous research evidences.

The significant main effect of phases emphasizes the overall efficacy of the interventions in reducing perceived stress among participants. As the Partial Eta Squared value (0.90) suggests that intervention caused drastic changes in the level of perceived stress, the interaction effect points to the importance of tailoring interventions to maximize group specific benefits. For instance, Yoga may provide immediate stress relief through physical relaxation, while Psychoeducation might impart ways of building long term cognitive resilience (Lee et al., 2021). According to Patel and Joshi (2019) integrated approaches work much better in alleviating the level of stress and therefore combining Yoga and Psychoeducation has reduced perceived stress effectively. Adolescents in the combined intervention group reported lower stress levels as they learnt to interpret life stressors and approach the situations with better coping strategies. Thus, it resulted in improved emotional regulation compared to groups receiving single interventions. Wilson and Clark (2020) found that psychoeducational sessions focusing on stress awareness, coping mechanisms and cognitive reframing reduced perceived stress levels in adolescents by 35%. The current study interventions effect was sustained during follow-up assessments, denoting the lasting impact of cognitive interventions.

c.Simple Main effects of Phase x Group Interaction on Perceived Stress

Phase	**Comparison (I–J)**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	5.07	1.19	< 0.001
	Yoga - Yoga and Psychoeducation	6.29	1.18	< 0.001
	Psychoeducation - Yoga and Psychoeducation	1.23	1.18	0.91
After	Yoga – Psychoeducation	6.87	1.14	<0 .001
	Yoga – Yoga and Psychoeducation	8.34	1.13	< 0.001
	Psychoeducation - Yoga and Psychoeducation	1.47	1.13	0.59
Follow-up	Yoga – Psychoeducation	8.00	0.98	<0 .001
	Yoga - Yoga and Psychoeducation	9.84	0.98	< 0.001
	Psychoeducation - Yoga and Psychoeducation	1.84	0.98	0.19

Table 24.c. presents the simple main-effects analyses were examined to clarify group-wise differences across phases. Yoga group reported significantly higher perceived stress in before intervention compared to both the Psychoeducation group and the Yoga and Psychoeducation group, while no significant difference was observed between the latter two groups. This pattern remained evident that After intervention it became more pronounced at Follow-up, with the Yoga group continuing to exhibit significantly higher stress levels than both comparison groups, whereas the Psychoeducation group and the Yoga and Psychoeducation group did not differ significantly across phases. The findings indicated that reductions in perceived stress were more substantial and sustained in interventions incorporating psychoeducational components. Consistent with the cognitive appraisal model of perceived stress and the Health Belief Model, psychoeducation may have enhanced adaptive interpretation and perceived control over menstruation-related experiences, thereby contributing to more effective stress reduction than yoga alone (Cohen et al., 1983). The results emphasize the importance of addressing cognitive and informational processes alongside experiential practices to achieve sustained reductions in perceived stress among adolescent school girls.

Table 25

Pairwise Comparisons for Perceived Stress among Before, After and Follow-up Phases across all groups

Phases(I)	Phases(J)	Mean Difference(I-J)	Standard Error
Before	**After**	12.08*	0.45
	Follow-up	15.42*	0.41
After	**Before**	-12.08*	0.45
	Follow-up	3.34*	0.37
Follow-up	**Before**	-15.42*	0.41
	After	-3.34*	0.37

***= Significant at 0.05 level**

Table 25 shows the pairwise comparisons for perceived stress during the before, after and follow-up phases which demonstrate significant changes in stress levels, highlighting the effectiveness of the interventions employed. The marked reduction in perceived stress from the before phase to the after phase (Mean Difference = 12.08, SE =

0.45, $p < 0.05$) suggests that the interventions yoga, psychoeducation and their combination were effective in mitigating stress. Additionally, the further reduction in the level of perceived stress from the before phase to the follow-up phase (Mean Difference = 15.42, SE = 0.41, $p < 0.05$) indicates sustained benefits of the interventions over time. However, the small yet significant increase in stress from the after to the follow-up phase (Mean Difference = 3.34, SE = 0.37, $p < 0.05$) implies that the interventions had a lasting impact; still there may be a partial regression in their effects, warranting additional or ongoing reinforcement.

The findings are similar with previous studies examining the impact of yoga and psychoeducation on stress. Streeter et al. (2012) reported that yoga interventions significantly decreased perceived stress by enhancing parasympathetic activity and emotional regulation, effects that are consistent with the reductions observed in this study. Similarly, studies on psychoeducation, such as the work by van der Heiden et al. (2013) shown its efficacy in improving stress coping mechanisms and promoting self-awareness, which could explain the immediate reductions in stress levels after the intervention.

The sustained reduction in stress observed at the follow-up phase aligns with research by Sharma et al. (2018) demonstrated that regular yoga practice fosters long term stress management by promoting mindfulness and resilience. Likewise, psychoeducation impact on stress was found to persist in follow-up assessments (Zauszniewski et al., 2012), noted that psychoeducation improved participants' cognitive appraisal of stressors over time. The slight increase in the level of perceived stress from the after to the follow-up phase mirrors findings by Pascoe et al. (2017), signifying that initial improvements are robust, but maintaining lower stress levels may require continuous engagement with the interventions. The findings also emphasize the potential additive benefits of combining yoga and psychoeducation. Michalsen et al. (2005) found that integrating mind body practices with psychoeducation equips an individual with essential knowledge and skills in managing persistent psychosocial demands, leading to greater reductions in stress compared to either intervention alone.

Table 26

Pairwise Comparisons for Perceived Stress among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference(I-J)	Standard Error
Yoga	**Psychoeducation**	5.31*	0.84
	Yoga and Psychoeducation	7.45*	0.84
Psychoeducation	**Yoga**	-5.31*	0.84
	Yoga and Psychoeducation	2.14*	0.84
Yoga and Psychoeducation	**Yoga**	-7.45*	0.84
	Psychoeducation	-2.14*	0.84

*** = Significant at 0.05 level**

Table 26 shows the Pairwise comparisons for perceived stress among adolescent school girls in the experimental groups (Yoga, Psychoeducation and their combination) revealed significant differences, highlighting the relative effectiveness of the interventions. The combination of yoga and psychoeducation demonstrated the greatest reduction in perceived stress compared to either intervention alone. Specifically, the mean stress reduction in the combined intervention group was significantly greater than in the yoga group (Mean Difference = 7.45, SE = 0.84, $p < 0.05$) and the psychoeducation group (Mean Difference = 2.14, SE = 0.84, $p < 0.05$). Similarly, the yoga group showed a significantly greater reduction in stress compared to the psychoeducation group (Mean Difference = 5.31, SE = 0.84, $p < 0.05$).

These findings corroborate previous research emphasizing the efficacy of yoga and psychoeducation in managing stress. For instance, Sharma et al. (2018) highlighted yoga's ability to significantly reduce stress by promoting mindfulness and physiological relaxation. In contrast, psychoeducation has been shown to improve stress management by enhancing cognitive coping strategies and increasing self-awareness, as reported by van der Heiden et al. (2013). The combination of yoga and psychoeducation appears to leverage the benefits of both interventions, leading to the greatest overall reduction in stress levels. This aligns with findings by Michalsen et al. (2005), who demonstrated that integrative mind body practices yield synergistic benefits, particularly in populations experiencing high stress.

The observed superiority of combined yoga and psychoeducation over yoga alone is consistent with Pascoe et al. (2017), who suggested that the addition of psychoeducational

components can reinforce behavioural and emotional changes initiated through physical interventions like yoga. Additionally, the slight advantage of the combined intervention over psychoeducation alone may reflect the added physiological benefits of yoga, such as improved autonomic regulation and reduced cortisol levels, as discussed by Streeter et al. (2012).

The results underscore the importance of multimodal interventions in addressing stress among adolescent populations, a group particularly vulnerable to psychological stress due to developmental and environmental pressures. This study adds to the growing body of evidence supporting the integration of yoga and psychoeducation for effective stress management in adolescents. Therefore the Hypotheses H4, H5 and H6 stating that **"There is significant difference during before, after and follow-up phases in level of Perceived Stress among Adolescent School Girls in the Yoga Group", "There is significant difference during before, after and follow-up phases in level of Perceived Stress among Adolescent School Girls in the Psychoeducation Group"** and **"There is significant difference during before, after and follow-up phases in level of Perceived Stress among Adolescent School Girls in the combined intervention (Yoga and Psychoeducation) Group"** are supported.

Figure 6

Mean Differences across Before, After and Follow-up phases among the Experimental Groups in level of Perceived Stress

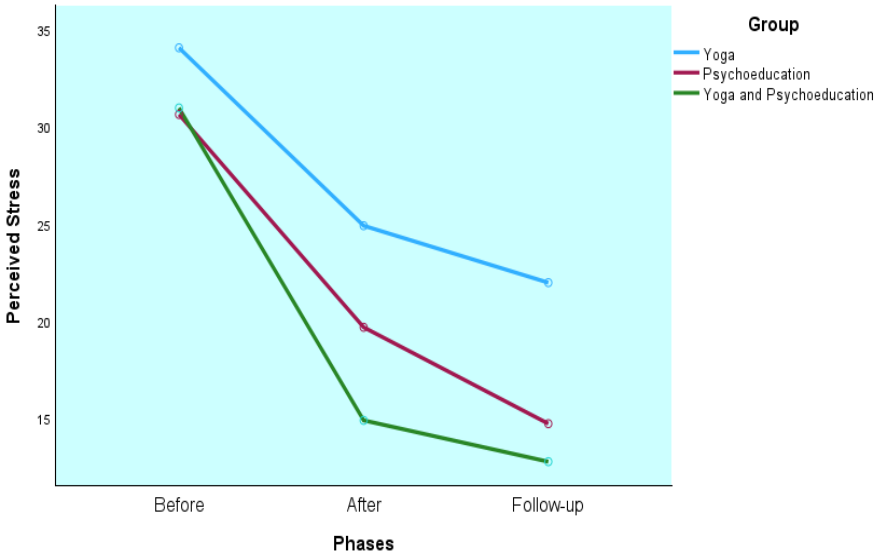


Table 27

Mean and Standard Deviation for Autonomy among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Autonomy	Group	N	Mean	Std. Deviation
	Yoga	30	10.53	2.54
Before	**Psychoeducation**	30	10.37	2.17
	Yoga and Psychoeducation	31	10.32	2.56
	Total	91	10.41	2.41
After	**Yoga**	30	13.73	1.96
	Psychoeducation	30	13.63	1.65
	Yoga and Psychoeducation	31	13.94	1.83
	Total	91	13.77	1.80
Follow -up	**Yoga**	30	14.53	2.29
	Psychoeducation	30	14.50	1.82
	Yoga and Psychoeducation	31	14.32	1.82
	Total	91	14.45	1.96

The table 27 displays the descriptive statistics for autonomy, a dimension of psychological well-being, among adolescent girls in the yoga, psychoeducation and combined intervention groups across the phases. Before the intervention, the autonomy scores were similar across groups, with mean scores of 10.53 (SD = 2.54) for yoga, 10.37 (SD = 2.17) for psychoeducation and 10.32 (SD = 2.56) for the combined intervention group. The baseline data shows that the groups had similar scores in the level of autonomy prior to intervention.

The level of autonomy scores increased in all the groups after the intervention according to the mean values. The yoga group reached a mean of 13.73 (SD = 1.96), the psychoeducation group possessed a mean of 13.63 (SD = 1.65) and the combined intervention group attained mean of 13.94 (SD = 1.83). The results evidences that all the three interventions positively strengthened the level of autonomy in the adolescent school girls. At the follow-up phase, a minimal increase in mean scores was seen in the yoga group M = 14.53, SD = 2.29, the psychoeducation group scoring M = 14.50, SD = 1.82 and the combined group M = 14.32, SD = 1.82.

Table 28

a. Mauchly's Test of Sphericity for Autonomy across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Autonomy	0.458	67.953	2	< .001	0.65	0.67	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the *Autonomy* dimension, $W = 0.458$, $\chi^2(2) = 67.953$, $p < .001$. As the Greenhouse–Geisser epsilon was below .75 ($\varepsilon = .65$), the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b.Mixed ANOVA for Autonomy among Adolescent School Girls in Yoga, Psychoeducation, and Yoga and Psychoeducation Groups

Autonomy		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	852.61	1.30	657.40	214.15**	0.71
Phases * Group	**Greenhouse-Geisser**	2.50	2.59	0.97	0.31 N.S.	0.01

**** = Significant at 0.05 level** **N.S. = Not Significant**

Table 28 shows the ANOVA examining the effect of the intervention across different phases on the Autonomy dimension of psychological well-being. The results indicated a statistically significant main effect of phases on autonomy, $F = 214.15$, $p < 0.01$, $\eta^2 = 0.71$. The before, after and follow-up phases of the study showed significant differences in the level of autonomy. The results implies that 71% of the variance in autonomy scores can be attributed to changes across the phases of the study as the effect size is large ($\eta^2 = 0.71$). The findings were significant across Greenhouse-Geisser, Huynh-Feldt and lower-bound corrections.

The interaction effect between phases and group was not statistically significant, $F(4, 0.63) = 0.31$, $p > 0.05$, $\eta^2 = 0.01$, denoting that changes in autonomy across phases did not differ significantly between groups. Yoga, Psychoeducation and Combined intervention

significantly enhanced the level of autonomy in the adolescent girls during before, after and follow-up phases, demonstrating an overall effect in psychological well-being. The findings support the effectiveness of the administered intervention in enhancing the level of autonomy, regardless of the type of intervention.

Table 29

Pairwise Comparisons for Autonomy among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference(I-J)	Standard Error
Before	**After**	-3.36*	0.22
	Follow-up	-4.04*	0.26
After	**Before**	3.36*	0.22
	Follow-up	-0.69*	0.12
Follow-up	**Before**	4.04*	0.26
	After	0.69*	0.12

*** = Significant at 0.05 level**

Table 29 portrays the pairwise comparisons for the level of autonomy during the before, after and follow-up phases among all the experimental groups. A significant increase in the level of autonomy was observed from before to after phase ($M = -3.36$, $SE = 0.22$, $p < 0.05$) and from the before to follow-up phase ($M = -4.04$, $SE = 0.26$, $p < 0.05$).

There was a minimal significant decline in the level of autonomy from the after to follow-up phase ($M = -0.69$, $SE = 0.12$, $p < 0.05$). The previous research findings support the role of structured and systematic interventions, such as different types of yoga practice and health education, in enhancing psychological well- being. As proven in studies like Sharma and Haider (2018), Yoga is evident in promoting self-regulation, which is an important practice associated to autonomy. Correspondingly, psychoeducation has been shown to improve decision making and self-awareness, imparting a sense of control and independence (van der Heiden et al., 2013). Pascoe et al. (2017) noted that active engagement with tailored interventions is critical for sustaining psychological benefits thus, the sustained improvements resulted in the level of autonomy at the follow-up phase aligns with the previous research evidence.

Michalsen et al. (2005) proposed that the effects of initial intervention are strong but maintaining these improvements may require consistent and continued practice or conduction of booster sessions. This accentuates the importance of developing strategies to

ensure long term adherence to interventions. The minor decline in the level of autonomy from after to follow-up phase is therefore substantiated. As the results demonstrate that the interventions were effective in enhancing autonomy among participants, sustained over time they contribute to the growing body of evidence supporting the use of interventions like yoga and psychoeducation for enhancing psychological well-being.

Figure 7

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in the level of Autonomy

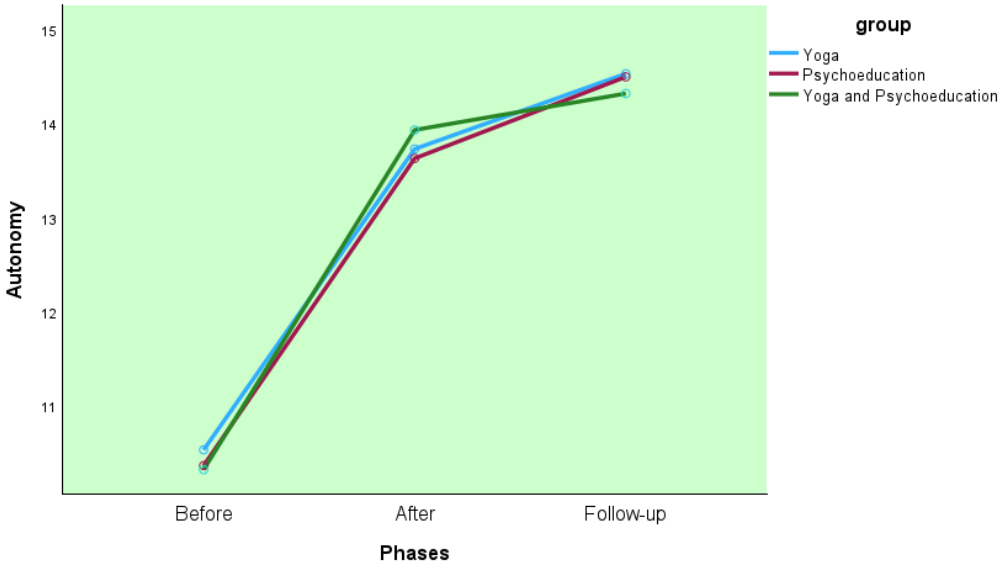


Table 30

Mean and Standard Deviation for Environmental Mastery among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Variable Environmental Mastery	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	11.83	1.86
	Psychoeducation	30	10.43	2.22
	Yoga and Psychoeducation	31	11.65	1.87
	Total	91	11.31	2.06
After	**Yoga**	30	12.07	1.66
	Psychoeducation	30	10.70	1.92
	Yoga and Psychoeducation	31	13.35	1.78
	Total	91	12.05	2.08
Follow -up	**Yoga**	30	12.40	1.40
	Psychoeducation	30	10.90	1.71
	Yoga and Psychoeducation	31	13.90	1.90
	Total	91	12.42	2.08

Table 30 shows the descriptive statistics for environmental mastery among adolescent girls in the Yoga, Psychoeducation and combined intervention groups from before phase to the follow-up phase.

The mean scores for environmental mastery in the before intervention phase were 11.83 (SD = 1.86) for the Yoga group, 10.43 (SD = 2.22) for the Psychoeducation group and 11.65 (SD = 1.87) for the combined intervention group, denoting some variation in the baseline levels across the groups. Mean scores increased to 12.07 (SD = 1.66) in the Yoga group, 10.70 (SD = 1.92) in the Psychoeducation group and 13.35 (SD = 1.78) in the combined group after the intervention phase, validating the effectiveness of the provided intervention in contributing to an improvement in environmental mastery, with the combined intervention group showing the highest increase.

The mean scores further increased, reaching 12.40 (SD = 1.40) in the Yoga group, 10.90 (SD = 1.71) in the Psychoeducation group and 13.90 (SD = 1.90) in the combined intervention group during the follow-up phase. The findings specify that the benefits of the interventions were sustained and the combined intervention group continued to show highest levels of environmental mastery.

Therefore, all interventions had a positive impact on the level of environmental mastery but the combined intervention of Yoga and Psychoeducation seems to be predominantly effective. The complementary nature of the integrated approaches in enhancing an individual's ability to manage and adapt to their environment is reflected in the findings.

Table 31

a. Mauchly's Test of Sphericity for Environmental Mastery across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Environmental Mastery	0.65	37.08	2	< 0.001	0.74	0.77	Violated	Greenhouse–Geisser

b.Mixed ANOVA for Environmental Mastery among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Environmental Mastery	Type III Sum of Squares		df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	56.90	1.49	38.32	58.78**	0.40
Phases * Group	**Greenhouse-Geisser**	35.86	2.97	12.08	18.53**	0.30

**** = Significant at 0.01 level**

Table 31 exhibits the results for environmental mastery in the Yoga, Psychoeducation and combined intervention groups during the study phases among adolescent school girls.

The main effect of phases was observed to be significant ($F = 58.78$, $p < 0.01$, $\eta p 2 = 0.40$), reflecting substantial changes in the level of environmental mastery during the intervention phases (before, after and follow-up). The partial eta squared ($\eta p2 = 0.40$) demonstrates a large effect size, as the phases explained a noteworthy portion of the variance in the level of environmental mastery. A significant interaction effect between phases and groups was identified ($F=18.53$, $p < 0.01$, $\eta p2 = 0.30$) and it indicates that the pattern of change in environmental mastery scores across the phases varied significantly among the Yoga, Psychoeducation and combined intervention groups. The partial eta squared ($\eta p2 = 0.30$) reflects a moderate effect size, differences in how the interventions impacted environmental mastery over time.

The main effect of phases suggests that all participants experienced significant improvements in environmental mastery as a result of the interventions. The intervention provided for the experimental groups show significant differences in the level of environmental mastery as per the findings of the interaction effect. This finding implies that each intervention positively influenced environmental mastery, the specific group dynamics or characteristics of each intervention probably played a role in shaping the outcomes.

The result demonstrates that the interventions were effective in enhancing the level of environmental mastery among the adolescent school girls, with significant changes observed during the study phases and among the experimental groups.

c. *Simple Main effects of Phase x Group Interaction on Environmental Mastery*

Phase	**Comparison (I–J)**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	1.40	0.51	0.02
	Yoga – Yoga and Psychoeducation	0.19	0.51	1.00
	Psychoeducation – Yoga and Psychoeducation	−1.21	0.51	0.06
After	Yoga – Psychoeducation	1.37	0.46	< 0.001
	Yoga – Yoga and Psychoeducation	−1.29	0.46	0.02
	Psychoeducation – Yoga and Psychoeducation	−2.66	0.46	< 0.001
Follow-up	Yoga – Psychoeducation	1.50	0.44	0.003
	Yoga – Yoga and Psychoeducation	−1.50	0.43	0.002
	Psychoeducation – Yoga and Psychoeducation	−3.00	0.43	< 0.001

The simple main-effects analyses show that, In the Before intervention, the Yoga group demonstrated slightly higher levels of environmental mastery than the Psychoeducation group, while no significant difference was observed between Yoga and the Yoga and Psychoeducation group, indicating relative baseline similarity. At the After phase, the Yoga and Psychoeducation group showed significantly higher environmental mastery compared to both Yoga and Psychoeducation groups, with the Psychoeducation group

exhibiting the lowest scores. This pattern became more pronounced at Follow-up, where the Yoga and Psychoeducation group continued to demonstrate superior environmental mastery relative to both comparison groups. The findings suggest that gains in environmental mastery were most robust and sustained when cognitive understanding provided through psychoeducation was complemented by experiential self-regulation practices inherent in yoga. Given that environmental mastery reflects an individual's capacity to manage everyday demands and contexts effectively, the observed interaction underscores the advantage of integrated interventions in fostering adaptive functioning during adolescence (Ryff, 1989, 2019).

Table 32

Pairwise Comparisons for Environmental Mastery among Before, After and Follow-up Phases across all groups

Phases(I)	Phases(J)	Mean Difference (I-J)	Standard Error
Before	**After**	-0.74*	0.08
	Follow-up	-1.10*	0.13
After	**Before**	0.74*	0.08
	Follow-up	-0.36*	0.10
Follow-up	**Before**	1.10*	0.13
	After	0.36*	0.10

***= Significant at 0.05 level**

Table 32 illustrates the pairwise comparisons for environmental mastery during before, after and follow-up phases. From before to after phase, there was a notable increase in the level of environmental mastery ($M = -0.74$, $SE = 0.08$, $p < 0.05$), indicating that the interventions effectively enhanced participants' ability to navigate and adapt to their surroundings. Further improvements were observed ($M = -1.10$, $SE = 0.13$, $p < 0.05$), in the before to follow-up phase, reflecting the positive impact of the administered interventions.

A significant increase in environmental mastery ($M = -0.36$, $SE = 0.10$, $p < 0.05$) between after and follow-up phases, shows that participants continued to improve and the

findings that highlight the durability of the interventions' effects, demonstrating their potential for enhancing and sustaining the level of psychological well-being.

The vital facets such as problem solving, adaptability and a sense of control are enhanced by Yoga and Psychoeducation which aids in managing external demands and building confidence in adapting to one's environment. Thus, the significant enhancement in the level of environmental mastery results imply the success of integrated interventions among adolescents, with sustained benefits extending beyond the active intervention phase.

Table 33

Pairwise Comparisons for Environmental Mastery among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	1.42*	0.45
	Yoga and Psychoeducation	-0.87N.S.	0.45
Psychoeducation	**Yoga**	-1.42*	0.45
	Yoga and Psychoeducation	-2.29*	0.45
Yoga and Psychoeducation	**Yoga**	0.87 N.S.	0.45
	Psychoeducation	2.29*	0.45

*** = Significant at 0.05 level** **N.S. = Not Significant**

The pairwise comparisons for the level of environmental mastery among the experimental groups (Yoga, Psychoeducation and the combination of Yoga and Psychoeducation) are shown in Table 33.

The mean differences between Yoga group Psychoeducation group ($M = 1.42$, $SE = 0.45$, $p < 0.05$) suggest that yoga may have a greater impact on developing adaptability and control over one's environment. The differences between the Yoga and the combined intervention group were not statistically significant ($M = -0.87$, $SE = 0.45$, $p > 0.05$). The Psychoeducation group had lower scores compared to the combined group ($M = -2.29$, $SE = 0.45$, $p < 0.05$) and the Yoga group ($M = -1.42$, $SE = 0.45$, $p < 0.05$). The combined intervention and Yoga alone group showed no significant difference ($M = 0.87$, $SE = 0.45$, $p > 0.05$). The combined intervention (Yoga and Psychoeducation) shows better

enhancement in the level of environmental mastery compared to the Psychoeducation (M = 2.29, SE = 0.45, $p < 0.05$) group. De Manincor et al. (2016) stated that yoga interventions can have a profound impact on psychological well-being through improved self-awareness, body control, emotional regulation and mindfulness which supports the findings of the current study. Also, psychoeducation is focus on cognitive restructuring and problem solving has been shown to promote the ability to make informed choices, creating favourable circumstances (Haug et al., 2012). The results suggest that Yoga is a highly effective intervention for enhancing environmental mastery among adolescent school girls and the combination of Yoga and Psychoeducation provides similar benefits.

Figure 8

Mean Differences across Before, After and Follow-up phases among the Experimental Groups in the level of Environmental Mastery

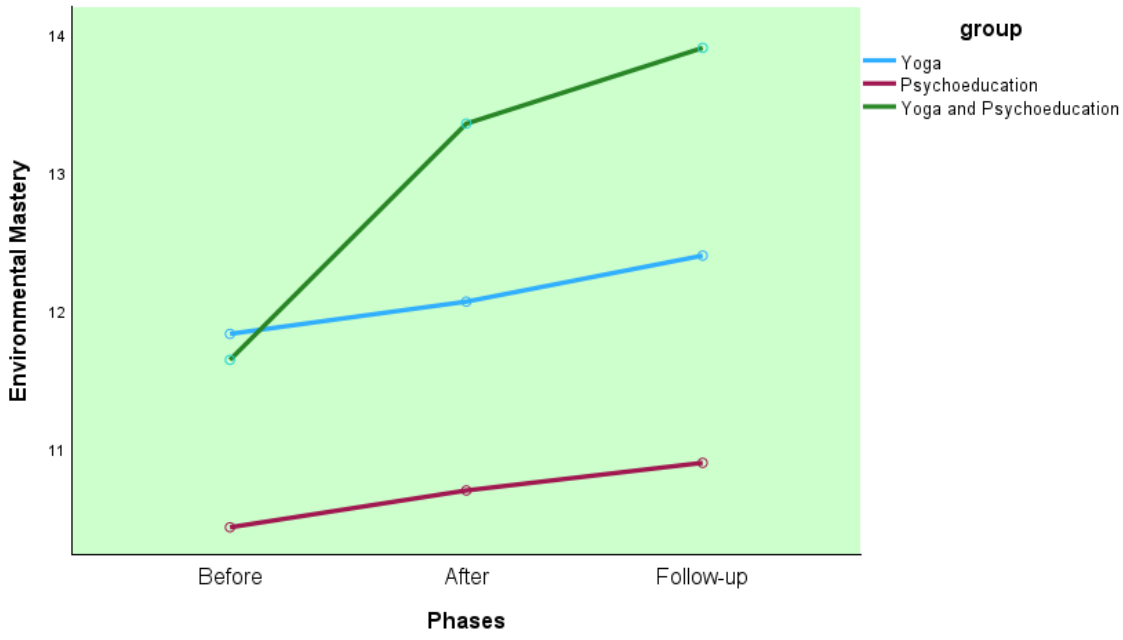


Table 34

Mean and Standard Deviation for Personal Growth among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Personal Growth	Group	N	Mean	Standard Deviation
	Yoga	30	10.63	1.87
Before	**Psychoeducation**	30	10.83	2.04
	Yoga and Psychoeducation	31	11.19	1.60
	Total	91	10.89	1.84
After	**Yoga**	30	11.27	1.26
	Psychoeducation	30	10.97	1.87
	Yoga and Psychoeducation	31	13.26	1.15
	Total	91	11.85	1.77
Follow -up	**Yoga**	30	11.77	1.07
	Psychoeducation	30	11.03	1.81
	Yoga and Psychoeducation	31	15.03	1.35
	Total	91	12.64	2.26

Table 34 portrays the descriptive statistics for personal growth among adolescent girls in the Yoga, Psychoeducation and combined intervention groups indicating notable changes during the study phases (before, after and follow-up). In the before intervention phase, the mean scores for personal growth were similar across groups: Yoga (M = 10.63, SD = 1.87), Psychoeducation (M = 10.83, SD = 2.04) and the combined intervention group (M = 11.19, SD = 1.60).

Improvements were observed among all the experimental groups in the after intervention phase. The Yoga group's mean increased to 11.27 (SD = 1.26), the Psychoeducation group to 10.97 (SD = 1.87) and the combined group to 13.26 (SD = 1.15). The combined intervention group displayed the higher mean in personal growth, indicating that integrating Yoga and Psychoeducation had an improved effect on personal development. At the follow-up phase, the Yoga group possessed a mean score of 11.77 (SD = 1.07), the Psychoeducation group had a mean of 11.03 (SD = 1.81) and the combined intervention group's mean was 15.03 (SD = 1.35). The combined group showed sustained improvement and evidences the potential that are long term by integrating Yoga and Psychoeducation for promoting personal growth.

Table 35

a. Mauchly's Test of Sphericity for Personal Growth across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Personal Growth	0.60	45.16	2	< 0.001	0.71	0.74	Violated	Greenhouse–Geisser

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the *Personal Growth* dimension, $W = 0.60$, $\chi^2(2) = 45.16$, $p < .001$. As the Greenhouse–Geisser epsilon was below .75 ($\varepsilon = .71$), indicating a moderate violation of sphericity, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b.Mixed ANOVA for Personal Growth among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Personal Growth		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Greenhouse-Geisser**	135.61	1.42	95.26	96.88**	0.52
Phases * Group	**Greenhouse-Geisser**	109.50	2.85	38.46	39.11**	0.47

**** = Significant at 0.01 level**

Table 35 shows the results for personal growth among adolescent school girls in the Yoga, Psychoeducation and combined Yoga and Psychoeducation groups. The main effect of phases shows significant differences ($F = 96.88$, $p < 0.01$, $\eta p2 = 0.52$), indicating that personal growth scores changed significantly across the intervention phases (before, after and follow-up). The large effect size ($\eta p2 = 0.52$) demonstrates a substantial proportion of the variance in personal growth scores is occurred due to the intervention. The value of the interaction effect between phases and groups was also significant ($F = 39.11$, $p < 0.01$, $\eta p2 = 0.47$), denoting that the change in personal growth scores varied among the Yoga, Psychoeducation and combined intervention groups. The partial eta squared value ($\eta p2 = 0.47$) shows a large effect size, explains the strengthened influence of the interventions in the level of personal growth among adolescent girls.

The main effect of phases suggests that personal growth improved significantly for all participants as they progressed through the intervention phases and the significant interaction effect points to differential impacts of the interventions.

c. Simple Main effects of Phase x Group Interaction on Personal Growth

Phase	**Group Comparison**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	−0.20	0.48	1.00
	Yoga – Yoga and Psychoeducation	−0.56	0.47	0.71
	Psychoeducation – Yoga and Psychoeducation	−0.36	0.47	1.00
After	Yoga – Psychoeducation	0.30	0.38	1.00
	Yoga – Yoga and Psychoeducation	−1.99	0.37	< 0.001
	Psychoeducation – Yoga and Psychoeducation	−2.29	0.37	<0 .001
Follow-up	Yoga – Psychoeducation	0.73	0.37	0.16
	Yoga – Yoga and Psychoeducation	−3.27	0.37	<0 .001
	Psychoeducation – Yoga and Psychoeducation	−4.00	0.37	< 0.001

The simple main-effects analyses to understand differential intervention effects across phases. Before intervention, no significant differences were observed among the Yoga, Psychoeducation, and Yoga and Psychoeducation groups, indicating comparable baseline levels of personal growth. In the After phase, the Yoga and Psychoeducation group demonstrated significantly higher personal growth compared to both Yoga and Psychoeducation groups, a pattern that strengthened at Follow-up, where the combined group continued to show markedly greater gains. In contrast, Yoga and Psychoeducation alone did not differ significantly from each other across phases. This suggests that personal growth, as a dimension reflecting self-development and openness to change, may be particularly responsive to interventions that integrate cognitive insight with experiential engagement. The sustained advantage of the Yoga and Psychoeducation group aligns with conceptualizations of personal growth as a developmental process facilitated by both

reflective understanding and embodied self-awareness, supporting the value of integrative approaches in promoting enduring psychological development during adolescence (Ryff, 1989; Fava & Ruini, 2018).

Table 36

Pairwise Comparisons for Personal Growth among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	-0.94*	0.12
	Follow-up	-1.72*	0.16
After	**Before**	0.94*	0.12
	Follow-up	-0.78*	0.08
Follow-up	**Before**	1.724*	0.16
	After	0.78*	0.08

*** = Significant at 0.05 level**

Table 36 portrays the pairwise comparisons for the level of personal growth during the study phases (before, after and follow-up). A significant increase in the level of personal growth ($M = -0.94$, $SE = 0.12$, $p < 0.05$) was observed from before to the after phase. Likewise, the follow-up phase showed significant differences from before intervention phase ($M = -1.72$, $SE = 0.16$, $p < 0.05$), suggesting that the interventions produced sustained long term benefits by enhancing personal growth among the adolescent girls. A significant increase in personal growth ($M = -0.78$, $SE = 0.08$, $p < 0.05$) was seen between after and follow-up phases.

In the view of existing research evidence, interventions such as yoga have been shown to enhance personal growth by promoting positive self-concept, analyzing one's strengths and limitations, being aware of one's self-efficacy and developing the ability to function to the fullest potential, as they are the key factors in fostering self-awareness and self-improvement (Sahni et al., 2021). The research evidences prove that psychoeducation is recognized for empowering individuals with cognitive tools to better understand and manage personal and social challenges, contributing to long term growth (Roehrig et al., 2013). The sustained improvements seen at the follow-up phase are consistent with studies underlining the enduring effects of integrative approaches that combine physical

and psychological techniques, as they address multiple dimensions of well-being (Büssing et al., 2012).

Strategies learnt through yoga, psychoeducation or their combination would need periodical reinforcement for sustaining personal growth beyond the intervention phase (Mead et al., 2010). The findings contribute to the growing body of evidence supporting interventions aimed at promoting psychological well-being and emphasize the need for rational strategies to sustain and optimize the lasting benefits.

Table 37

Pairwise Comparisons for Personal Growth among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	0.28 N.S.	0.37
	Yoga and Psychoeducation	-1.94*	0.37
Psychoeducation	**Yoga**	-0.28 N.S.	0.37
	Yoga and Psychoeducation	-2.22*	0.37
Yoga and Psychoeducation	**Yoga**	1.94*	0.37
	Psychoeducation	2.22*	0.37

*** = Significant at 0.05 level** **N.S.= Not Significant**

Table 37 illustrates the pairwise comparisons for the level of personal growth in the experimental groups among the adolescent school girls. The combined intervention group demonstrated significantly greater improvement in the level of personal growth compared to both Yoga ($M = 1.94$, $SE = 0.37$, $p < 0.05$) and Psychoeducation ($M = 2.22$, $SE = 0.37$, $p < 0.05$) group. The integrated approach using Yoga and Psychoeducation strengthens personal growth outcomes, by simultaneously addressing multiple dimensions of psychological well-being.

The differences observed between Yoga and Psychoeducation experimental group were not statistically significant ($M = 0.28$, $SE = 0.37$, $p > 0.05$), representing that these individual interventions may have comparable effects on the level of personal growth as both approaches independently contribute to the development of self-awareness, self-worth and resilience their combination appears to yield more pronounced improvements.

Yoga, activates the parasympathetic nervous system which equips the adolescents to in build resources to meet the rising life demands and has shown effectiveness in strengthening emotional stability and self-improvement (Sahni et al., 2021).Psychoeducation enhances positive coping skills, empowering individuals to meet challenges and engage in self-directed growth (Roehrig et al., 2013). The combined approach effects the strengths of both strategies, leading to holistic and significant improvements in personal growth (Büssing et al., 2012).

The use of combined intervention is supported by studies that used multimodal approaches which have been specifically effective in adolescent populations, where the intersection of physical, emotional and cognitive development necessitates comprehensive strategies to enhance personal growth (Mead et al., 2010).

Thus, the results emphasize the importance of multimodal strategies in promoting psychological well-being.

Figure 9

Mean Differences across Before, After and Follow-up phases among the Experimental Groups in the level of Personal Growth

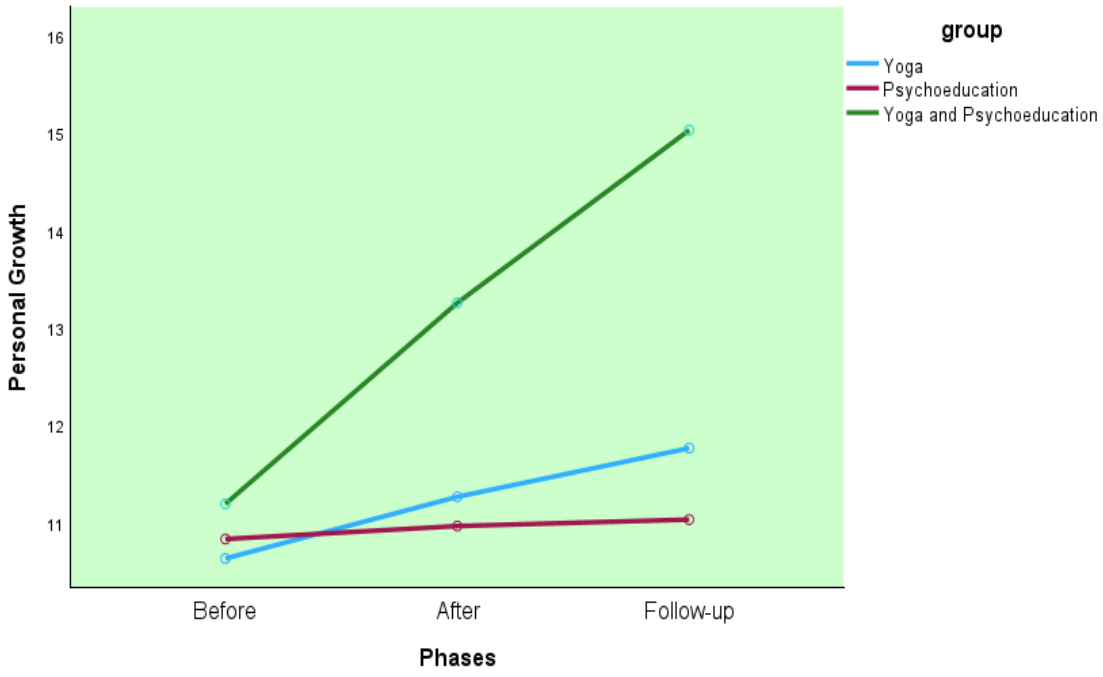


Table 38

Mean and Standard Deviation for Positive Relations among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Positive Relations	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	10.10	1.52
	Psychoeducation	30	10.43	1.79
	Yoga and Psychoeducation	31	10.23	1.48
	Total	91	10.25	1.59
After	**Yoga**	30	10.37	1.43
	Psychoeducation	30	10.60	1.59
	Yoga and Psychoeducation	31	11.55	1.55
	Total	91	10.85	1.59
Follow -up	**Yoga**	30	10.70	1.37
	Psychoeducation	30	10.67	1.54
	Yoga and Psychoeducation	31	13.06	1.63
	Total	91	11.49	1.88

Table 38 displays the descriptive statistics for positive relations among adolescent girls in the Yoga, Psychoeducation and combined intervention group across the intervention phases (before, after and follow-up). In before phase, the mean scores for positive relations were relatively similar across groups: Yoga (M = 10.10, SD = 1.52), Psychoeducation (M = 10.43, SD = 1.79), and Yoga and Psychoeducation (M = 10.23, SD = 1.48). In the after intervention phase, increase in the level of positive relations were observed in all the experimental groups. The mean scores increased to 10.37 (SD = 1.43) in the Yoga group, 10.60 (SD = 1.59) in the Psychoeducation group, and 11.55 (SD = 1.55) in the combined intervention group. The mean scores at the follow-up phase in the Yoga group was 10.70 (SD = 1.37), the Psychoeducation group scored 10.67 (SD = 1.54), and the combined group exhibited a substantial increase to 13.06 (SD = 1.63). The findings indicate that all three interventions contributed positively to the development of positive relations among the participants and the combined intervention group demonstrates maximum changes in the mean score.

Table 39

a. Mauchly's Test of Sphericity for Positive Relations across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Positive Relations	0.79	21.05	2	< 0.001	0.82	0.86	Violated	Huynh–Feldt

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Positive Relations dimension, W = 0.79, $\chi^2(2) = 21.05$, $p < 0.001$. As the Huynh–Feldt epsilon exceeded 0.75 (ε = .86), indicating a mild violation of sphericity, the Huynh–Feldt correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b. Mixed ANOVA for Positive Relations among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Positive Relations		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Huynh-Feldt**	68.20	1.71	39.84	89.20**	0.50
Phases * Group	**Huynh-Feldt**	61.18	3.42	17.87	40.01**	0.48

**** = Significant at 0.01 level**

Table 39 shows the results for the level of positive relations among adolescent school girls in intervention groups during the study phases. The main effect of phases was significant (F = 89.20, p < 0.01, ηp2 = 0.50), reflecting considerable changes in positive relations scores across the phases (before, after and follow-up). The partial eta squared (ηp2 = 0.50) denotes a large effect size proving that the variance in positive relations is explained by the phases of intervention. The phases and groups' interaction effect shows significant differences (F = 40.01, p < 0.01, ηp2 = 0.48), reflecting that level of positive relations varied among the Yoga, Psychoeducation and combined intervention groups. The large effect size (ηp2 = 0.48) emphasizes the enhancement of positive relations as a result of the provided intervention. The main effect of phases suggests that all groups experienced significant improvements in positive relations as they progressed through the intervention phases.

The finding highlights the efficacy of the interventions in enhancing the level of positive relations as, one of the inevitable social demands in adolescence is to build healthy relationships and, in this stage, the teenagers begin to build their social networks apart from family. Hence, learning helpful strategies to build and sustain healthy bonds is essential.

c. *Simple Main effects of Phase x Group Interaction on Positive Relations*

Phase	**Group Comparison**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	−0.33	0.41	1.00
	Yoga – Yoga and Psychoeducation	−0.13	0.41	1.00
	Psychoeducation – Yoga and Psychoeducation	0.21	0.41	1.00
After	Yoga – Psychoeducation	−0.23	0.39	1.00
	Yoga – Yoga and Psychoeducation	−1.18	0.39	< 0.001
	Psychoeducation – Yoga and Psychoeducation	−0.95	0.39	0.05
Follow-up	Yoga – Psychoeducation	0.03	0.39	1.00
	Yoga – Yoga and Psychoeducation	−2.37	0.39	< 0.001
	Psychoeducation – Yoga and Psychoeducation	−2.40	0.39	<0 .001

The simple main-effects shows that, the Before Intervention, no significant differences were observed among the Yoga, Psychoeducation, and Yoga and Psychoeducation groups, indicating comparable baseline levels of positive relations. In the After Intervention, the Yoga and Psychoeducation group demonstrated significantly higher positive relations compared to the Yoga group, while differences with the Psychoeducation group approached significance. This pattern became more pronounced at Follow-up, with the Yoga and Psychoeducation group exhibiting significantly higher levels of positive relations than both comparison groups. These findings suggest that improvements in interpersonal functioning were most evident when experiential practices such as yoga were combined with psychoeducational components that may enhance empathy, communication and relational awareness. Given that positive relations reflect social connectedness and emotional reciprocity, the observed interaction highlights the value of integrated

interventions in fostering sustained interpersonal well-being during adolescence (Ryff, 1989; Van der Kolk, 2021)

Table 40

Pairwise Comparisons for Positive Relations among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	-0.59*	0.07
	Follow-up	-1.22*	0.10
After	**Before**	0.59*	0.07
	Follow-up	-0.64*	0.10
Follow-up	**Before**	1.22*	0.10
	After	0.64*	0.11

***= Significant at 0.05 level**

Table 40 portrays the pairwise comparisons for positive relations, across the before, after and follow-up phases revealed significant improvements over time. There was a significant increase in positive relations ($M = -0.59$, $SE = 0.07$, $p < 0.05$) from before to after intervention phase, suggesting that the interventions produced immediate benefits in participants' ability to establish and maintain meaningful interpersonal connections. The significant differences from the before intervention to the follow-up phase ($M = -1.22$, $SE = 0.10$, $p < 0.05$) highlights the sustained and progressive impact of the interventions over time.

Likewise, the significant improvement in the level of positive relations ($M = -0.64$, $SE = 0.10$, $p < 0.05$) was seen from the after intervention to the follow-up phase.

Yoga has been shown to enhance interpersonal skills through improved self-awareness (Khalsa et al., 2015). Psychoeducation has been found to enhance empathy, resilience, active listening which are the critical components of positive interpersonal relationships (Gonzalez et al., 2012). Interpersonal well-being is built and enhanced through educational interventions (Mead et al., 2010).The results indicate that the interventions were effective in improving positive relations, with significant immediate benefits and sustained improvements.

Table 41

Pairwise Comparisons for Positive Relations among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	-0.18 N.S.	0.38
	Yoga and Psychoeducation	-1.22*	0.38
Psychoeducation	**Yoga**	0.18 N.S.	0.38
	Yoga and Psychoeducation	-1.05*	0.38
Yoga and Psychoeducation	**Yoga**	1.22*	0.38
	Psychoeducation	1.05*	0.38

*** = Significant at 0.05 level** **N.S. = Not Significant**

Table 41 exhibits the pairwise comparisons for the level of positive relations among adolescent school girls in the experimental groups (Yoga, Psychoeducation and the combined intervention).

The Yoga and Psychoeducation group showed significant greater improvements in positive relations compared to the Yoga group ($M = 1.22$, $SE = 0.38$, $p < 0.05$) and the Psychoeducation group ($M = 1.05$, $SE = 0.38$, $p < 0.05$). Yoga and Psychoeducation groups ($M = -0.18$, $SE = 0.38$, $p > 0.05$) showed no significant differences. Thus, Yoga and Psychoeducation independently contribute to enhancing interpersonal well-being through distinct mechanisms, such as fostering self-awareness and emotional stability in Yoga and improving problem solving and empathy in Psychoeducation.

These results are consistent with existing literature on psychological well-being interventions. Practicing yoga has been found to increase relationship satisfaction through enhanced self-concept. Evron (2014) concluded that regular yoga practice contributed to individuals' ability to relate more authentically and compassionately, thus improving their relational quality (Evron, 2014). A more recent study examined the effects of partner-based yoga among female college students. The findings showed that it enhanced not only their well-being but also altruistic tendencies, thereby strengthening interpersonal bonds (Liu et al., 2024; Dagar et al., 2022). Psychoeducation promotes a collaborative understanding between clients and mental health professionals. This approach strengthens the therapeutic

alliance and enhances interpersonal communication skills, both critical to forming healthy relationships (Çelik & Pesen, 2022; Raypole, 2022).

Figure 10

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in level of Positive Relations

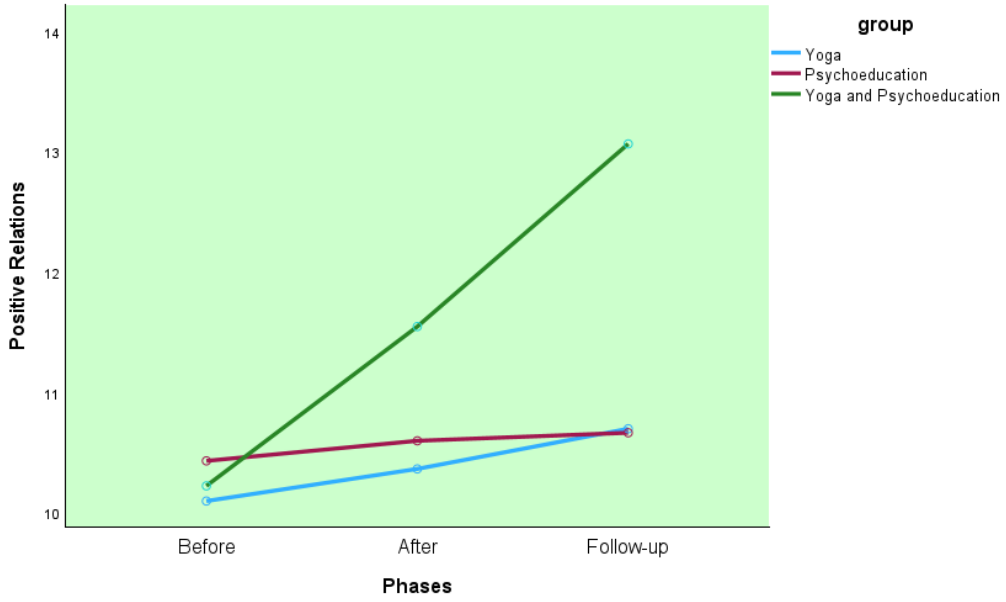


Table 42

Mean and Standard Deviation for Purpose in Life among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Purpose in Life	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	10.53	1.94
	Psychoeducation	30	10.30	1.44
	Yoga and Psychoeducation	31	11.68	1.33
	Total	91	10.85	1.69
After	**Yoga**	30	11.67	1.35
	Psychoeducation	30	10.43	1.33
	Yoga and Psychoeducation	31	13.16	1.55
	Total	91	11.77	1.80
Follow-up	**Yoga**	30	11.90	1.42
	Psychoeducation	30	10.50	1.25
	Yoga and Psychoeducation	31	14.19	1.33
	Total	91	12.22	2.03

Table 42 displays the descriptive statistics for purpose in life, a critical dimension of psychological well-being, reflects the degree to which individuals perceive their lives as meaningful and directed among adolescent girls in the Yoga, Psychoeducation and combined intervention group show notable improvements across the intervention phases (before, after, and follow-up). In the before intervention phase, the mean scores for Yoga (M = 10.53, SD = 1.94), Psychoeducation (M = 10.30, SD = 1.44) and the combined intervention group (M = 11.68, SD =1.33) suggest that participants in the combined intervention group had slightly greater sense of purpose in life compared to the yoga and psychoeducation groups.

The experimental groups showed improvements in the after intervention phase. The Yoga group scores increased to M = 11.67, SD = 1.35, the Psychoeducation group to M = 10.43, SD =1.33 and the combined intervention group to M = 13.16, SD = 1.55.

At the follow-up phase, The Yoga group further improved to M = 11.90, SD = 1.42, the Psychoeducation group to M = 10.50, SD = 1.25 and the combined group to M = 14.19, SD =1.33. The results indicate that yoga, psychoeducation and combined intervention has enhanced the level of purpose in life among the adolescent girls.

Table 43

a. Mauchly's Test of Sphericity for Purpose in Life across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Purpose in Life	0.80	19.63	2	< 0.001	0.83	0.87	Violated	Huynh–Feldt

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the *Purpose in Life* dimension, $W = 0.798$, $\chi^2(2) = 19.63$, $p < .001$. As the Huynh–Feldt epsilon exceeded 0.75 (ε =0 .87), indicating a mild violation of sphericity, the Huynh–Feldt correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b. Mixed ANOVA for Purpose in Life among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Purpose in Life		Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Phases	**Huynh-Feldt**	87.64	1.73	50.64	78.60**	0.47
Phases * Group	**Huynh-Feldt**	42.63	3.46	12.32	19.12**	0.30

**** = Significant at 0.01 level**

Table 43 presents the data of the ANOVA for purpose in life dimension among adolescent school girls in Yoga, Psychoeducation and combined intervention groups.

A substantial main effect of phases was observed ($F = 78.60$, $p < 0.01$, $\eta p^2 = 0.47$), indicating significant changes in purpose in life scores across the intervention phases (before, after and follow-up). The partial eta squared value ($\eta p^2 = 0.47$) reflects a considerable effect size, suggesting that a significant proportion of the variance in purpose in life is attributable to the intervention phases. A significant interaction effect between phases and groups was identified ($F = 19.12$, $p < 0.01$, $\eta p2 = 0.30$), representing that the change in purpose in life scores notably differed across the Yoga, Psychoeducation and combined intervention groups. The partial eta squared ($\eta p^2 = 0.30$) indicates a moderate effect size, proving that the interventions showed different impact in the participants depending on the intervention group they belonged to.

The main effect of phases reveals that purpose in life improved significantly over time across all groups, suggesting that each intervention was effective in fostering a greater sense of meaning and direction. The interaction effect indicates that the extent of improvement differed among the groups, with the combined Yoga and Psychoeducation intervention likely the most benefited group. This differential impact suggests that integrating physical and cognitive elements may have a cumulative effect on enhancing purpose in life.

The findings highlight the effectiveness of Yoga, Psychoeducation and their combination in promoting purpose in life among adolescents. These results provide valuable insights into the relative efficacy of these interventions.

c. Simple Main effects of Phase x Group Interaction on Purpose in Life

Phase	**Group Comparison**	**Mean Difference (I–J)**	**SE**	***P***
Before	Yoga – Psychoeducation	0.23	0.41	1.00
	Yoga – Yoga and Psychoeducation	−1.14	0.41	0.02
	Psychoeducation – Yoga and Psychoeducation	−1.38	0.41	0.003
After	Yoga – Psychoeducation	1.23	0.37	0.003
	Yoga – Yoga and Psychoeducation	−1.50	0.36	<0 .001
	Psychoeducation – Yoga and Psychoeducation	−2.73	0.36	< 0.001
Follow-up	Yoga – Psychoeducation	1.40	0.35	< 0.001
	Yoga – Yoga and Psychoeducation	−2.29	0.34	< 0.001
	Psychoeducation – Yoga and Psychoeducation	−3.69	0.34	< 0.001

The simple main-effects for Purpose in Life across phases show that in the Before phase, the Yoga and Psychoeducation group demonstrated significantly higher purpose in life compared to both the Yoga and Psychoeducation groups, while no significant difference was observed between Yoga and Psychoeducation alone. This pattern intensified in the After phase, with the Yoga and Psychoeducation group continuing to exhibit significantly higher levels of purpose in life than both comparison groups, a trend that was further strengthened at Follow-up. In contrast, the Yoga and Psychoeducation-only groups showed comparatively smaller gains across phases. The findings suggest that a clear sense of purpose may be particularly responsive to interventions that integrate cognitive meaning-making with experiential engagement. From a theoretical perspective, psychoeducation may facilitate goal clarity and value-based reflection, while yoga may support self-regulatory processes that sustain purposeful orientation over time. Together, these components appear to foster more enduring enhancements in purpose in life during adolescence (Ryff, 1989).

Table 44

Pairwise Comparisons for Purpose in Life among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	-0.92*	0.12
	Follow-up	-1.36*	0.12
After	**Before**	0.912*	0.12
	Follow-up	-0.44*	0.08
Follow-up	**Before**	1.36*	0.12
	After	0.44*	0.08

*** = Significant at 0.05 level**

Table 44 illustrates the pairwise comparisons for purpose in life across the before, after, and follow-up phases. From before to after phase, there was a significant increase in purpose in life scores ($M = -0.92$, $SE = 0.12$, $p < 0.05$), suggesting that the interventions had an immediate effect on enhancing participants' sense of meaning and direction. Further improvement was observed from before to follow-up phase ($M = -1.36$, $SE = 0.12$, $p < 0.05$), indicating that the benefits of the interventions were sustained and continued to grow over time.

From after to follow-up phase, a significant increase ($M = -0.44$, $SE = 0.08$, $p < 0.05$) was seen in the purpose in life dimension. The pattern suggests that though the interventions set a strong foundation for improvement, additional support or continued practice might be needed to maintain momentum.

The findings concur with the concept that structured interventions can develop psychological growth over time, emphasizing both the immediate and long term benefits for participants. The results underline the importance of addressing purpose in life as a key aspect of psychological well-being, particularly during formative years.

Table 45

Pairwise Comparisons for Purpose in Life among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	0.96*	0.34
	Yoga and Psychoeducation	-1.64*	0.34
Psychoeducation	**Yoga**	-0.96*	0.34
	Yoga and Psychoeducation	-2.60*	0.34
Yoga and Psychoeducation	**Yoga**	1.64*	0.34
	Psychoeducation	2.60*	0.34

***= Significant at 0.05 level**

Table 45 presents the pairwise comparisons for purpose in life among the experimental groups (Yoga, Psychoeducation, and the combined Yoga and Psychoeducation) highlight that the differences observed were significant and thereby proves the effectiveness of the interventions.

The Yoga and Psychoeducation group demonstrated significantly greater improvement in purpose in life compared to both the Yoga group ($M = 1.64$, $SE = 0.34$, $p < 0.05$) and the Psychoeducation group ($M = 2.60$, $SE = 0.34$, $p < 0.05$). This finding shows that integrative approach combining physical and cognitive elements provide a considerable effect leading to the enhancement of purpose in life.

The Yoga group showed significantly higher scores than the Psychoeducation group ($M = 0.96$, $SE = 0.34$, $p < 0.05$), indicating that Yoga may be more effective as a separate intervention for enhancing the level of purpose in life compared to Psychoeducation.

The emotional and cognitive aspects of purpose in Life are targeted by the combined intervention. Yoga independently enhances mindfulness and emotional stability and Psychoeducation focuses on cognitive development and self-awareness therefore, their integration appears to magnify the overall impact.

The findings conclude that all interventions positively influenced purpose in life, with the combined intervention group providing the most distinct results. These results emphasize the importance of designing integrative interventions that target multiple dimensions of psychological well-being to optimize outcomes for adolescent populations.

Figure 11

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in level of Purpose in Life

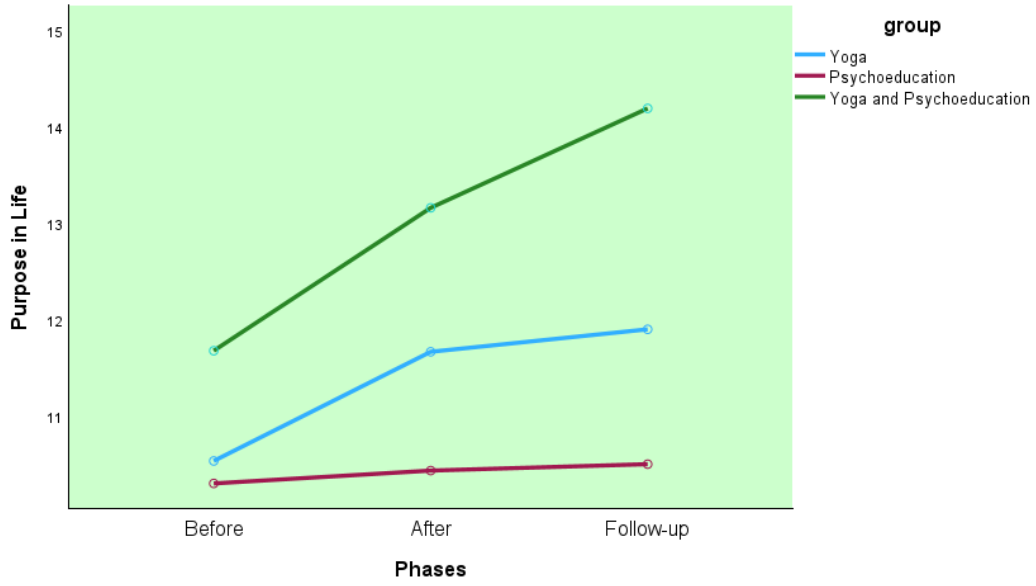


Table 46

Mean and Standard Deviation for Self Acceptance among Adolescent Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Self Acceptance	Group	N	Mean	Standard Deviation
Before	**Yoga**	30	10.30	2.25
	Psychoeducation	30	10.27	1.89
	Yoga and Psychoeducation	31	11.39	1.48
	Total	91	10.66	1.95
After	**Yoga**	30	11.70	1.56
	Psychoeducation	30	10.43	1.72
	Yoga and Psychoeducation	31	13.65	1.56
	Total	91	11.95	2.08
Follow-up	**Yoga**	30	12.07	1.44
	Psychoeducation	30	10.57	1.57
	Yoga and Psychoeducation	31	14.74	1.39
	Total	91	12.48	2.27

Table 46 portrays the descriptive statistics for self acceptance among adolescent girls in the Yoga, Psychoeducation, and combined Yoga and Psychoeducation groups reveal significant changes across the intervention phases (before, after and follow-up). Self acceptance is an important dimension of psychological well-being which reflects an individual's ability to acknowledge and embrace their strengths and limitations.

In the before phase, the mean scores for self acceptance were comparable across the Yoga group (M = 10.30, SD = 2.25) and the Psychoeducation group (M = 10.27, SD = 1.89), while the combined Yoga and Psychoeducation group had a slightly higher mean score (M = 11.39, SD = 1.48). These results suggest similar starting levels of self acceptance for the Yoga and Psychoeducation groups, with the combined group exhibiting a marginally higher baseline.

Following the interventions, all groups showed improvements in self acceptance. The Yoga group increased to M = 11.70, SD = 1.56, the Psychoeducation group to M = 10.43, SD = 1.72 and the combined Yoga and Psychoeducation group to M = 13.65, SD = 1.56. The largest improvement during this phase was observed in the combined intervention group, indicating that integrating Yoga and Psychoeducation had a more pronounced effect compared to either intervention alone.

At the follow-up phase, the Yoga group further improved to M = 12.07, SD = 1.44, the Psychoeducation group to M = 10.57, SD = 1.57 and the combined intervention group reached M = 14.74, SD = 1.39. These results suggest that the combined intervention had the most substantial and sustained impact on self acceptance over time.

The findings demonstrate that all three interventions positively influenced self acceptance and the combined intervention group consistently achieved the highest levels of improvement. This highlights the potential benefits of a holistic approach that integrates physical and cognitive strategies.

Table 47

a. Mauchly's Test of Sphericity for Self-Acceptance across Phases

Dimension	Mauchly's *W*	χ^2	*df*	*p*	ε (GG)	ε (HF)	Sphericity Assumption	Correction Used
Self Acceptance	0.79	19.620	2	< .001	0.83	0.87	Violated	Huynh–Feldt

Mauchly's Test of Sphericity indicated that the assumption of sphericity was violated for the Self-Acceptance dimension, $W = 0.79$, $\chi^2(2) = 19.62$, $p < 0.001$. As the Huynh–Feldt epsilon exceeded 0.75 ($\varepsilon = 0.87$), indicating a mild violation of sphericity, the Huynh–Feldt correction was applied to adjust the degrees of freedom in the mixed ANOVA.

b.Mixed ANOVA for Self -acceptance among Adolescent School Girls in Yoga, Psychoeducation and Yoga and Psychoeducation Groups

Self Acceptance		Type III Sum of Squares	Df	Mean Square	F	Partial Eta Squared
Phases	**Huynh-Feldt**	156.92	1.73	90.67	98.82**	0.53
Phases * Group	**Huynh-Feldt**	75.06	3.46	21.68	23.63**	0.35

**** = Significant at 0.01 level**

Table 47 presents the ANOVA for self acceptance among adolescent school girls in the Yoga, Psychoeducation and combined intervention groups. A significant main effect of phases ($F = 98.82$, $p < 0.01$, $\eta p2 = 0.53$), indicated that self acceptance scores changed substantially across the before, after and follow-up phases. The partial eta squared ($\eta p2 = 0.53$) reflects a large effect size, signifying that a considerable proportion of the variance in self acceptance is caused by the administered intervention. A significant interaction effect between phases and groups was identified ($F = 23.63$,$p < 0.01$, $\eta p2 = 0.35$) suggesting that the changes in self acceptance over time varied significantly between the Yoga, Psychoeducation and combined intervention groups. A moderate effect size ($\eta p2 = 0.35$), highlights that the specific intervention type influenced the course of improvements in self acceptance domain.

The main effect of phases indicates that self acceptance improved significantly for all participants during the before, after and follow-up phases, accentuating the effectiveness of the yoga, psychoeducation and combined intervention. The interaction effect reveals that the extent of these improvements differed among the experimental groups.

c.Simple Main effects of Phase x Group Interaction on Self-acceptance

Phase	Group Comparison	Mean Difference (I–J)	SE	*P*
Before	Yoga – Psychoeducation	0.03	0.49	1.00
	Yoga – Yoga and Psychoeducation	−1.09	0.49	0.08
	Psychoeducation – Yoga and Psychoeducation	−1.12	0.49	0.07
After	Yoga – Psychoeducation	1.27	0.42	< 0.001
	Yoga – Yoga and Psychoeducation	−1.95	0.41	<0 .001
	Psychoeducation – Yoga and Psychoeducation	−3.21	0.41	< 0.001
Follow-up	Yoga – Psychoeducation	1.50	0.38	< 0.001
	Yoga – Yoga and Psychoeducation	−2.68	0.38	< 0.001
	Psychoeducation – Yoga and Psychoeducation	−4.18	0.38	< 0.001

The simple main-effects analyses shows that the Before phase, no significant differences were observed among the Yoga, Psychoeducation and Yoga and Psychoeducation groups, indicating comparable baseline levels of self-acceptance. After intervention, the Yoga and Psychoeducation group demonstrated higher self-acceptance compared to both Yoga and Psychoeducation groups, a pattern that became more pronounced at Follow-up, where the combined group continued to show the most favourable outcomes. In contrast, the Yoga and Psychoeducation-only groups exhibited comparatively smaller improvements across phases. These findings suggest that self-acceptance, as a dimension reflecting positive self-regard and integration of personal experiences, is particularly responsive to interventions that combine cognitive reframing with embodied self-awareness. Psychoeducation may facilitate adaptive reinterpretation of self- concept related beliefs, while yoga supports experiential acceptance, together fostering sustained enhancement in self-acceptance during adolescence (Fava & Ruini, 2018)

Table 48

Pairwise Comparisons for Self acceptance among Before, After and Follow-up Phases across all groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Before	**After**	-1.28*	0.15
	Follow-up	-1.81*	0.14
After	**Before**	1.28*	0.15
	Follow-up	-0.53*	0.10
Follow-up	**Before**	1.81*	0.14
	After	0.53*	0.10

*** = Significant at 0.05 level**

Table 48 shows the pairwise comparisons for self acceptance in the before, after, and follow-up phases which denotes significant improvements over time, indicating the effectiveness of the interventions in enhancing self acceptance dimension of psychological well-being among participants.

From the before to the after phase, a significant increase in self acceptance was observed ($M = -1.28$, $SE = 0.15$, $p < 0.05$; $M = -1.28$, $SE = 0.15$, $p < 0.05$; $M = -1.28$, $SE = 0.15$, $p < 0.05$), suggesting that the interventions produced immediate benefits in developing self acceptance. A more pronounced increase was noted from the before to the follow-up phase ($M = -1.81$, $SE = 0.14$, $p < 0.05$; $M = -1.81$, $SE = 0.14$, $p < 0.05$; $M = -1.81$, $SE = 0.14$, $p < 0.05$), emphasizing the impact of the interventions to be sustained and progressive.

Between the after and follow-up phases, a significant improvement ($M = -0.53$, $SE = 0.10$, $p < 0.05$; $M = -0.53$, $SE = 0.10$, $p < 0.05$; $M = -0.53$, $SE = 0.10$, $p < 0.05$) was reflected. This gradual improvement accentuates the stable influence of the interventions in promoting self acceptance, even after the active intervention period.

These findings are consistent with the notion that structured interventions effectively contribute to personal growth and self-awareness which are considered as the key aspects of self acceptance. The results support the importance of enhancing self acceptance in adolescents, as it is critical for achieving their optimal well-being.

Table 49

Pairwise Comparisons for Self acceptance among the Adolescent School Girls in the Experimental Groups

Phases (I)	Phases (J)	Mean Difference (I-J)	Standard Error
Yoga	**Psychoeducation**	0.93 N.S.	0.39
	Yoga and Psychoeducation	-1.90*	0.38
Psychoeducation	**Yoga**	-0.93 N.S.	0.39
	Yoga and Psychoeducation	-2.84*	0.38
Yoga and Psychoeducation	**Yoga**	1.90*	0.38
	Psychoeducation	2.84*	0.38

*** = Significant at 0.05 level** **N.S.= Not Significant**

Table 49 represents the pairwise comparisons for self acceptance among the experimental groups' show significant differences in the effectiveness of the provided interventions. The combined intervention group demonstrated significant greater improvement in self acceptance compared to the Yoga group ($M = 1.90$, $SE=0.38$, $p < 0.05$) and the Psychoeducation group ($M = 2.84$, $SE=0.38$, $p < 0.05$). The finding proves that integrated physical and cognitive strategies produce a long lasting effect in enhancing self acceptance. Daubenmier (2005) found that women who practiced yoga reported higher levels of body satisfaction and self acceptance compared to those engaged in aerobic exercises. Correspondingly, a worksite yoga programme demonstrated significant improvements in participants' self acceptance, quality of life and stress levels (Hartfiel et al., 2011).

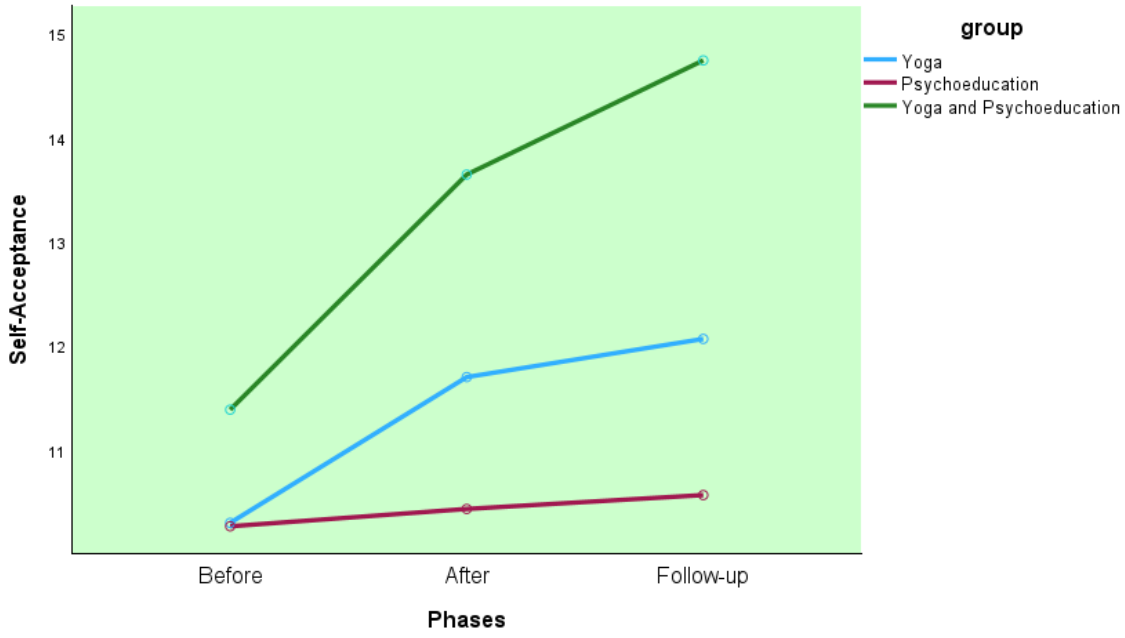
No significant difference was found in Yoga and Psychoeducation groups ($M = 0.93$, $SE = 0.39$, $p > 0.05$), reflecting that the individual interventions had similar effects on self acceptance when applied separately. The results support the importance of using holistic interventions to achieve more comprehensive improvements in self acceptance.

The current study demonstrates that combining these approaches yields the most significant benefits and serves as a evidence for the efficacy of integrative methods in adolescents. The results highlight combined Yoga and Psychoeducation group producing the most pronounced effects. Therefore the Hypotheses H7, H8 and H9 stating that **"There is significant difference during before, after and follow-up phases in Dimensions of**

Psychological Well-being among Adolescent School Girls in the Yoga Group", "There is significant difference during before, after and follow-up phases in Dimensions of Psychological Well-being among Adolescent School Girls in the Psychoeducation Group" and **"There is significant difference during before, after and follow-up phases in Dimensions of Psychological Well-being among Adolescent School Girls in the combined intervention (Yoga and Psychoeducation) Group" are supported. Hypotheses 10 stating that "Yoga and Psychoeducation (combined intervention) is significantly more effective in enhancing favourable Menstrual Attitude, Psychological Well-being and reducing Perceived Stress among Adolescent School Girls" is partially supported.**

Figure 12

Mean Differences during Before, After and Follow-up phases among the Experimental Groups in level of Self Acceptance



Discussion

The present study generated a comprehensive body of results examining changes in menstrual attitude, perceived stress and psychological well-being across three intervention conditions: Yoga, Psychoeducation and a Combined Intervention measured at before, after and follow-up phases.

The findings indicate that all three interventions were beneficial, demonstrating that school-based, non-clinical approaches can positively influence adolescents' menstrual-related cognitions and psychological functioning. However, the magnitude, breadth and sustainability of these effects varied systematically across outcomes and intervention conditions. A consistent pattern emerged in which the Combined Intervention (Yoga with Psychoeducation) produced more robust and enduring changes across multiple domains, particularly for the primary outcome of menstrual attitude and for stress reduction. This pattern suggests that interventions addressing both belief structures and physiological self-regulation are better suited to the complex, multidimensional nature of menstrual experience during adolescence.

Across phases, the results revealed that immediate after-intervention gains were evident across most variables, indicating short-term responsiveness to all intervention modalities. The follow-up assessments demonstrated that not all gains were equally sustained. Dimensions that were closely linked to cognitive reframing and embodied experience such as perceptions of menstruation as a natural rather than debilitating event and reductions in perceived stress showed greater maintenance over time, particularly in the Combined Intervention group. In contrast, constructs that are more deeply embedded within personality development or socio-cultural conditioning, such as autonomy and anticipatory beliefs about menstruation, exhibited comparatively limited change. Across intervention conditions, yoga-based practices demonstrated particular effectiveness in reducing bodily discomfort, emotional reactivity and stress-related responses, while psychoeducation was especially influential in modifying maladaptive beliefs, myths and stigma associated with menstruation. The Combined Intervention integrated these mechanisms, resulting in a broader impact that extended beyond symptom reduction to include positive shifts in self-acceptance, environmental mastery and personal growth. This integrative pattern underscores the importance of addressing both how adolescents think about menstruation and how they experience it in their bodies.

The results of the present study therefore provide a strong empirical basis and the different intervention components produced differential effects is discussed in the subsequent sections of this chapter.

Menstrual Attitude

Menstrual attitude was conceptualised as the primary outcome of the present study based on evidence from the review of literature indicating that adolescents' beliefs and affective orientations toward menstruation play a central role in shaping menstrual experiences. Menstrual attitude reflects culturally and socially internalised meanings associated with menstruation and influences how adolescents interpret bodily changes, anticipate menstrual onset and emotionally respond to

menstrual events (Brooks-Gunn & Ruble, 1980; Marván & Vacio, 2018). Accordingly, the present study examined changes in menstrual attitude dimensions as direct outcomes of intervention, rather than as mediators or predictors of other psychological variables.

The findings demonstrated that menstrual attitudes are modifiable through structured school-based interventions, though the extent of change varied across attitudinal dimensions, intervention conditions and phases of assessment. This pattern reinforces the view that menstrual attitude is a multidimensional construct, with certain belief components more amenable to short-term intervention than others.

The perception of menstruation as a debilitating event reflects beliefs that menstruation interferes with daily functioning, physical capacity and emotional stability. In the present study, significant reductions in this perception were observed across intervention groups, with comparatively greater improvements in the Combined Intervention condition. Within the Health Belief Model framework, such beliefs correspond to perceived severity and perceived barriers, which have been shown to be particularly responsive to interventions that enhance understanding and coping resources.

Psychoeducation likely contributed to change in this dimension by correcting misconceptions and reframing menstruation as a normative biological process rather than a disabling condition. Yoga, through embodied engagement, may have complemented this process by allowing participants to experience bodily competence and regulation during the intervention period. The combined intervention appeared to reinforce these effects by integrating cognitive clarification with experiential reassurance. Importantly, these changes are interpreted as direct modifications of menstrual-related beliefs, not as outcomes contingent upon changes in stress or well-being.

The bothersome dimension captures irritation, inconvenience and subjective discomfort associated with menstruation. Both the Yoga and Combined Intervention groups demonstrated meaningful reductions in this perception, suggesting that somatically oriented practices may be particularly effective in addressing attitudes grounded in bodily sensation and affective reactivity. Previous research has indicated that bodily awareness and relaxation practices can alter subjective interpretations of discomfort, thereby influencing experiential attitudes toward menstruation (Chrisler & Johnston-Robledo, 2016).

Psychoeducation alone showed comparatively modest influence on this dimension, highlighting that attitudes rooted in sensory experience may be less responsive to information-based approaches. The findings suggest that menstrual attitudes linked to physical experience may require embodied interventions, whereas belief-based dimensions respond more readily to cognitive input.

The perception of menstruation as a natural and acceptable bodily process represents a positive attitudinal orientation and is closely linked to body acceptance and reduced menstrual stigma. The present study found that this dimension improved notably in the Combined Intervention group. Psychoeducation likely played a central role by situating menstruation within a biological and developmental framework, thereby countering culturally transmitted notions of abnormality or impurity (Marván & Vacio, 2018).

Yoga may have reinforced this cognitive reframing by fostering embodied acceptance and reducing alienation from bodily processes. The integration of these approaches appears to have facilitated a shift toward normalisation and acceptance, supporting the view that positive menstrual attitudes can be strengthened through interventions that address both knowledge and lived bodily experience.

Anticipation of menstruation reflects expectancies, worry and emotional preparedness related to the onset of the menstrual cycle. In the present study, this dimension showed limited change across intervention conditions. This finding suggests that anticipatory beliefs may be shaped by cumulative prior experiences, peer narratives and familial attitudes, rendering them less responsive to short-term intervention. Anticipatory anxiety has been identified in the literature as a stable cognitive–emotional pattern that often requires prolonged or repeated intervention exposure to modify meaningfully (Brooks-Gunn & Ruble, 1980).

The relative stability of this dimension highlights an important boundary of brief school-based programmes and underscores the need for sustained or developmentally timed interventions to address anticipatory components of menstrual attitude.

Denial of menstrual effects reflects a tendency to minimise or psychologically distance oneself from the physical and emotional impact of menstruation. In the present study, this dimension remained largely unchanged across groups and phases. Denial may function as an avoidant coping strategy, particularly in socio-cultural contexts where open acknowledgment of menstrual discomfort is discouraged. Unlike other attitudinal dimensions, denial is not readily aligned with Health Belief Model constructs such as perceived severity or benefits and may instead reflect deeper coping or socialisation processes.

The absence of significant change in this dimension suggests that denial-based attitudes may require emotion-focused or relational intervention approaches, such as reflective dialogue, peer support, or family engagement, rather than informational or somatic strategies alone. Importantly, the stability of this dimension does not indicate intervention failure but rather illustrates the differential modifiability of menstrual attitude components.

Phase-Wise Interpretation

Across dimensions, changes in menstrual attitude were most evident at the post-intervention phase, with selective maintenance at follow-up, particularly in the Combined Intervention group. This pattern suggests that while menstrual attitudes are responsive to intervention, the durability of change depends on the depth of cognitive and experiential integration achieved during the intervention period.

The findings affirm menstrual attitude as a central, multidimensional and partially modifiable construct in adolescent menstrual health. By demonstrating dimension-specific responsiveness and differential intervention effects, the study extends existing literature and provides a nuanced understanding of how menstrual attitudes can be addressed within school-based, theory-guided intervention frameworks.

Perceived Stress

Perceived stress was included as a secondary outcome in the present study based on evidence from the review of literature indicating that stress is a prominent psychosocial factor associated with menstruation during adolescence. Prior research has shown that menstruation-related experiences often coexist with heightened stress appraisal due to physiological changes, academic demands and socio-cultural expectations placed on adolescent girls (Cohen et al., 1983). Accordingly, perceived stress was conceptualised in this study as a parallel outcome variable, rather than as a consequence or mediator of menstrual attitude change.

The findings demonstrated that perceived stress levels decreased across phases in all three intervention groups, suggesting that yoga, psychoeducation and their combination were effective in addressing stress appraisal among adolescent school girls. These findings are consistent with earlier studies indicating that psychoeducational interventions help adolescents develop adaptive coping strategies, particularly when combined with mind–body practices (Jayasinghe et al., 2021). The present results support the view that structured, school-based interventions can positively influence stress experiences even in non-clinical populations.

Psychoeducation appears to have contributed to stress reduction by providing adolescents with a clearer understanding of stress mechanisms and coping strategies. By enhancing awareness of physiological and psychological responses to stress, psychoeducation may reduce ambiguity and perceived uncontrollability, which are central components of stress appraisal (Cohen et al., 1983). Importantly, these changes are interpreted as direct effects of the intervention on stress-related cognition, rather than as outcomes contingent upon changes in menstrual attitude, as no statistical analyses were conducted to examine such relationships.

Yoga-based interventions likely influenced perceived stress through physiological and emotional regulation pathways. Previous research has demonstrated that yoga reduces stress by lowering physiological arousal and cortisol levels, thereby promoting relaxation and emotional balance (Khalsa et al., 2020). In the present study, simplified yoga practices may have enabled participants to manage stress more effectively by enhancing bodily awareness and relaxation, irrespective of specific menstrual beliefs.

The Combined Intervention demonstrated comparatively greater reductions in perceived stress across phases, indicating that integrating psychoeducation with yoga may offer a more comprehensive approach to stress management. This finding aligns with existing evidence suggesting that the effectiveness of psychoeducational strategies is strengthened when combined with mind–body practices (Jayasinghe et al., 2021). These results are interpreted as comparative effectiveness of intervention modalities, not as evidence of interaction effects between menstrual attitude and perceived stress.

Phase-wise observations indicated that reductions in perceived stress were evident at post-intervention and largely sustained at follow-up, particularly in the combined intervention group. These findings suggest that adolescents were able to retain and apply stress-management strategies introduced during the intervention period.

The findings reinforce the importance of addressing perceived stress as a key psychosocial factor in adolescent menstrual health research. Therefore, yoga and psychoeducation, individually and in combination can effectively reduce perceived stress among adolescent school girls.

Psychological Well-Being

Psychological well-being was examined as a secondary outcome based on evidence from the review of literature indicating that menstruation-related experiences during adolescence are often embedded within broader psychosocial functioning. Conceptualised as a multidimensional construct encompassing autonomy, environmental mastery, personal growth, positive relations, purpose in life and self-acceptance, psychological well-being reflects long-term adaptive functioning shaped by developmental, social and contextual influences (Ryff, 2019).

With respect to autonomy, the findings indicated that there were no significant differences across experimental groups and neither yoga nor psychoeducation alone demonstrated an immediate influence on this dimension. Autonomy is widely understood as a deeply ingrained personality-related characteristic, shaped by early life experiences, socialisation processes and enduring interpersonal relationships. As such, it is less amenable to modification through short-term, structured interventions delivered in group settings (Ryff, 2019). Previous research has also

suggested that autonomy is influenced more strongly by societal norms, individual life experiences and intrinsic motivation rather than by isolated intervention exposure (Deci & Ryan, 2020). In this context, the absence of significant change in autonomy observed in the present study is theoretically consistent and highlights an important boundary of brief school-based interventions. Interventions aimed at enhancing autonomy may require longer duration, individualised engagement and personalised mentoring or coaching approaches.

In contrast, the dimensions of environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance demonstrated significant improvement, particularly in the Combined Intervention group. Environmental mastery reflects the ability to manage everyday demands and utilise available resources effectively. The combined exposure to psychoeducation and yoga may have enhanced adolescents' perceived competence in navigating daily challenges by providing both cognitive understanding and experiential regulation strategies.

Improvements in personal growth and self-acceptance are consistent with earlier research indicating that psychoeducational interventions foster self-awareness, cognitive flexibility and reflective capacity, thereby supporting positive self-evaluation and openness to personal development (Fava & Ruini, 2018). By engaging adolescents in structured reflection and knowledge-based understanding, psychoeducation may have contributed to greater acceptance of bodily and emotional experiences, including those related to menstruation.

Enhancements observed in positive relations with others and purpose in life may be attributed to the complementary influence of yoga-based practices. Yoga has been associated with improved emotional regulation, heightened interpersonal sensitivity and the cultivation of healthy social connections, which may facilitate more fulfilling relationships and a clearer sense of meaning (Van der Kolk, 2021). The group-based nature of the interventions may have further supported relational comfort and shared understanding among participants.

The findings further indicate that the Combined Intervention was particularly effective in strengthening multiple dimensions of psychological well-being simultaneously. While yoga and psychoeducation were effective when applied individually, their integration appeared to offer a more comprehensive framework that addressed both cognitive interpretation and embodied regulation. This combined approach may have enabled adolescents to interpret experiences more adaptively and select healthier coping mechanisms when encountering stressors, thereby supporting overall psychological functioning.

The present study does not posit causal pathways between menstrual attitude, perceived stress and psychological well-being, as no statistical analyses were conducted to examine such

relationships. Rather, these constructs were conceptualised as interrelated but parallel outcomes, grounded in evidence from the review of literature. The findings collectively suggest that integrated interventions can contribute to improvements across multiple psychosocial domains without implying directional effects.

The results demonstrate that while autonomy remains relatively stable in response to short-term intervention, other dimensions of psychological well-being are more responsive, particularly when cognitive and mind–body approaches are combined. These findings reinforce the value of multidimensional, school-based interventions in supporting adolescent psychological well-being alongside menstrual health outcomes.

The findings demonstrate a clear distinction between the primary outcome of menstrual attitude and the secondary outcomes of perceived stress and psychological well-being. Menstrual attitude showed more specific and intervention-sensitive change, particularly in dimensions related to negative beliefs and normalisation of menstruation, supporting its positioning as the primary outcome. These changes were most consistent in the Combined Intervention group, reflecting the close alignment between intervention content and menstrual-related cognitions.

In contrast, perceived stress and psychological well-being functioned as broader psychosocial outcomes influenced by multiple contextual and developmental factors. While reductions in perceived stress and improvements in selected dimensions of psychological well-being were observed, these changes were less dimension-specific and more diffuse in nature. Importantly, the patterns of change across outcomes are interpreted as parallel intervention effects rather than causal relationships.

Practical Significance

The findings of the present study demonstrate meaningful practical relevance within a school-based adolescent population. The Combined Intervention consistently produced more robust and sustained improvements across menstrual attitude, perceived stress and key dimensions of psychological well-being. Even moderate changes in menstrual beliefs particularly reductions in debilitating and bothersome perceptions and increased normalisation are practically significant, given the deeply entrenched socio-cultural narratives surrounding menstruation. Such shifts can influence adolescents' comfort, participation and emotional regulation in everyday school contexts.

Improvements in perceived stress and selected dimensions of psychological well-being further underscore the applied value of the interventions. Reductions in stress appraisal and enhancements in environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance reflect improvements in adaptive functioning rather than transient change. The

selective non-responsiveness of autonomy reinforces the interpretive credibility of the findings, indicating that the interventions influenced modifiable domains while leaving more stable personality-related dimensions unchanged.

The findings are theoretically coherent with the Health Belief Model, which emphasises the role of perceived severity, perceived barriers and perceived benefits in shaping health-related beliefs and behaviours. The observed changes in menstrual attitude suggest a recalibration of maladaptive health beliefs through psychoeducation and embodied experience. From a coping perspective, the interventions provided adolescents with cognitive and physiological strategies for managing stressors, aligning with appraisal-based models of stress and coping. Further, the pattern of changes across psychological well-being dimensions is consistent with Ryff's model, which posits that environmental mastery, personal growth, self-acceptance and positive relations are more responsive to contextual and experiential influences than autonomy.

Methodological Reflections

The findings of the present study should be interpreted in light of several methodological considerations that shaped both the scope and applicability of the results. The use of a before–after–follow-up design with active comparator groups, rather than a no-treatment control group, was a deliberate and ethically informed choice given the school-based context. Withholding potentially beneficial interventions from adolescent participants was neither feasible nor appropriate; therefore, comparisons across intervention modalities provided a pragmatic alternative while enhancing ecological validity.

Participant selection involved purposive screening to ensure relevance to the research objectives. While this approach strengthened internal relevance, it may limit generalisability to broader adolescent populations. However, focusing on a defined school-based sample allowed for controlled intervention delivery and consistent assessment across phases, which is particularly important in developmental research.

Potential testing and maturation effects must also be considered, as adolescents undergo rapid cognitive and emotional changes over time. The inclusion of multiple assessment phases, including follow-up, helped differentiate intervention-related change from short-term reactivity or maturation alone. These factors cannot be entirely disentangled within the present design and warrant cautious interpretation.

Intervention fidelity was supported through structured session delivery and standardised content across groups. Variations in individual engagement and contextual school factors may have

influenced responsiveness. Such variability reflects real-world implementation conditions and enhances the practical relevance of the findings, even as it introduces heterogeneity in outcomes.

Implications

The findings of the present study have clear implications for the design and implementation of school-based adolescent health programmes. The demonstrated effectiveness of yoga and psychoeducation particularly when delivered in combination highlights the value of integrating cognitive and mind–body approaches within educational settings. Schools may benefit from incorporating structured psychoeducational modules alongside simplified physical practices to address menstrual health and broader psychosocial functioning in a developmentally appropriate manner.

From a research perspective, the findings state the importance of longitudinal assessment in intervention studies involving adolescents. The observed Phase × Group interaction effects suggest that follow-up evaluations are essential for understanding the sustainability of intervention outcomes. Future studies may extend this work by employing longer intervention durations, incorporating booster sessions or examining family- and community-level influences to address more stable constructs such as autonomy. Additionally, research designs that allow for the examination of inter-variable relationships could further elucidate the complex associations among menstrual attitude, stress and psychological well-being.

The findings demonstrated that menstrual attitude, perceived stress and psychological well-being are responsive to school-based interventions, with the combined yoga and psychoeducation approach yielding more consistent and sustained benefits.