

CHAPTER 6

RESULTS

6.1 STUDY ONE

6.1.1 Baseline Characteristics

The table 1 contains the descriptive statistics of all the measured dependent variables across T1, T2, and T3. The n was 102 at T1, except for two of the subdomains in the variable emotion regulation questionnaire, where due to some technical reason, we failed to collect the data. The general trend that can be observed is almost all the variables have shown improvement in scores after the residential intervention at T2 and tend to diminish after 3-months of follow-up. The table 2 shows the correlation between the measured variables at the baseline.

The internal consistencies, Cronbach's alpha for various questionnaires used in this study were: 0.84 for Mindfulness Attention Awareness Scale, 0.87 for Negative Affect of PANAS, 0.86 for Positive Affect of PANAS scale, 0.77 for perceived stress scale, 0.69 for ERQ Reappraisal, and 0.77 for ERQ Suppression.

Table 6.1 : Study1 - Baseline characteristics – mean and std. deviation

Mean and standard deviations of dependent variables at baseline (T1), after residential intervention (T2), and after 3-months follow-up (T3)

Variable	T1 (n=102*)		T2 (n=102*)		T3 (n=83)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Mindfulness	4.27	0.75	4.62	0.77	4.58	0.88
2. Reappraisal	29.22	6.18	30.71	5.94	28.43	7.72
3. Suppression	15.65	5.67	15.69	6.07	16.52	5.69
4. PosAffect	34.02	6.47	38.3	5.1	35.43	6.72
5. NegAffect	19.53	7.00	14.52	4.93	15.6	5.25
6. Perceived Stress	15.71	5.33	13.36	5.52	13.48	6.56

Note. * For two sub domains of Emotion Regulation Questionnaire, n the n were 86 and 85 at T1 and T2 for Reappraisal, and 86 and 86 at T1 and T2 for Suppression.

Table 6.2 : Study1 - Baseline characteristics – correlations

Correlations with 95% confidence intervals of all the variables at baseline

Variable	1	2	3	4	5
1. Mindfulness_T1					
2. Reappraisal_T1	.04 [-.17, .25]				
3. Suppression_T1	-.17 [-.37, .05]	.18 [-.03, .38]			
4. PosAffect_T1	.30** [.11, .47]	.10 [-.11, .31]	-.08 [-.29, .13]		
5. NegAffect_T1	-.40** [-.55, -.23]	-.11 [-.32, .10]	.01 [-.20, .22]	-.24* [-.41, -.04]	
6. PSS_T1	-.49** [-.62, -.32]	-.05 [-.26, .17]	.01 [-.20, .23]	-.38** [-.53, -.20]	.60** [.46, .71]

Note. * indicates $p < .05$. ** indicates $p < .01$.

6.1.2 Linear Mixed Effects Model

Linear mixed effects model was used as our design had some missing values and therefore, we had unbalanced repeated measures data. We performed the one-way repeated measures analysis using linear mixed effect model with Time (T1, T2, and T3) and the fixed factor and each of the measured variables as dependent variables one at a time. We used subject as a random factor in all these models. The results are presented in the table 3. Planned contrasts were done using the paired sample *t*-test to test if the means have changed at T2 and T2 compared to the baseline T1. 0.05 was fixed as the level of statistical significance. The mindfulness score has changed significantly over three assessment points. The change after the residential program compared to baseline was significant, $t(101) = 5.35, p < .001, d = 0.53$, and the increase in the MAAS scores after the follow-up compared to the baseline was not significant, $t(82) = 2.93, p = .004, d = 0.32$, where *t* is the *t*-statistic from paired samples *t*-test, *p* is the *p*-value of the statistic, and *d* is the Cohen's effect size. The Perceived Stress Scores (PSS) have reduced significantly after residential orientation compared to the baseline, $t(101) = -5.81, p < .001, d = -0.58$, and there was a significant decrease after the follow-up compared to the baseline, $t(82) = -3.39, p = .001, d = -0.37$. The ERQ-Reappraisal scores have improved significantly after residential orientation compared to baseline, $t(83) = 2.35, p = .021, d = 0.26$, and there was a significant decrease after the follow-up compared to the baseline, $t(68) = -1.54, p = .128, d = -0.19$.

The ERQ-Suppression scores have increased after residential program compared to the baseline, but the change was not statistically significant, $t(83) = 0.18, p = .86, d = 0.02$, and the scores increased after the follow-up compared to the baseline, but again statistically non-significant, $t(68) = 1.00, p = .32, d = 0.12$. The PANAS Positive Affect scores have increased significantly after residential orientation compared to the baseline $t(101) = 6.95, p < .001, d = 0.69$, and there was an increase after the follow-up compared to the baseline which was not statistically significant, $t(82) = 1.42, p = .141, d = 0.16$. The Negative Affect scores decreased significantly after residential orientation compared to the baseline, $t(101) = -7.00, p < .001, d = -0.69$, and there was a significant decrease after the follow-up compared to the baseline, $b = -0.86, t(82) = -4.92, p = .04, d = -0.54$.

Table 6.3: Study1 - Repeated measures results using linear mixed effects model

		Estimate	Std.Error	df	t-value	p-value
Baseline	(Intercept)	4.47	0.07	185	66.17	< .001
Model 1	(Intercept)	4.27	0.08	183	54.47	< .001
(MAAS)	MAAS_T2	0.35	0.07	183	4.97	< .001
	MAAS_T3	0.26	0.08	183	3.49	0.001
Comparison of model Fit:					$\chi^2(2) = 25.07, p < .001$	
Baseline	(Intercept)	14.23	0.48	185	29.92	< .001
Model 2	(Intercept)	15.71	0.57	183	27.45	< .001
(PSS)	PSS_T2	-2.34	0.56	183	-4.20	< .001
	PSS_T3	-2.26	0.60	183	-3.77	< .001
Comparison of model Fit:					$\chi^2(2) = 20.86, p < .001$	
Baseline	(Intercept)	29.57	0.51	154	57.55	< .001
Model 2	(Intercept)	29.44	0.71	152	41.51	< .001
(ERQ- Reappraisal)	ERQreappraisal_T2	1.51	0.83	152	1.83	0.069
	ERQreappraisal_T3	-1.04	0.85	152	-1.22	0.224
Comparison of model Fit:					$\chi^2(2) = 8.82, p = .012$	
Baseline	(Intercept)	15.97	0.48	154	32.98	< .001
Model 2	(Intercept)	15.68	0.61	152	25.64	< .001
(ERQ- Suppression)	ERQsuppression_T2	-0.01	0.63	152	-0.02	0.982
	ERQsuppression_T3	0.85	0.66	152	1.29	0.200
Comparison of model Fit:					$\chi^2(2) = 2.19, p = .334$	
Baseline	(Intercept)	35.91	0.48	185	74.43	< .001
Model 2	(Intercept)	34.02	0.61	183	56.08	< .001
(PANAS- Positive)	Posaffect_T2	4.28	0.64	183	6.69	< .001
	Posaffect_T3	1.20	0.69	183	1.74	0.083
Comparison of model Fit:					$\chi^2(2) = 42.27, p < .001$	
Baseline	(Intercept)	16.65	0.44	185	37.44	< .001
Model 2	(Intercept)	19.53	0.58	183	33.78	< .001
(PANAS- Negative)	Negaffect_T2	-5.01	0.65	183	-7.68	< .001
	Negaffect_T3	-3.79	0.70	183	-5.43	< .001
Comparison of model Fit:					$\chi^2(2) = 55.14, p < .001$	

Note. MAAS= Mindfulness Attention Awareness Scale, ERQ= Emotion Regulation Questionnaire, PANAS= Positive and Negative Affect Scale

Table 6.4: Study1 – Paired sample t test results

	Mindfulness	Perceived Stress	Reappraisal	Suppression	Positive Affect	Negative Affect
Residential	t(101) = 5.35, p < .001*, d = 0.53	t(101) = -5.81, p < .001*, d = -0.58	t(83) = 2.35, p = .021*, d = 0.26	t(83) = 0.18, p = .86, d = 0.02	t(101) = 6.95, p < .001*, d = 0.69	t(101) = -7.00, p < .001*, d = -0.69
Follow Up	t(82) = 2.93, p = .004*, d = 0.32	t(82) = -3.39, p = .001*, d = -0.37	t(68) = -1.54, p = .128, d = -0.19	t(68) = 1.00, p = .32, d = 0.12	t(82) = 1.42, p = .141, d = 0.16	t(82) = -4.92, p = .04*, d = -0.54

t is the *t*-statistic from paired samples *t*-test, *p* is the *p*-value of the statistic, and *d* is the Cohen's effect size; * indicates $p < .001$

6.2 STUDY TWO

6.2.1 Baseline Characteristics

The table 1 contains the descriptive statistics of all the measured dependent variables across T1, T2, and T3. The *n* was 77 at T1 and T2. Most of the variables have improved in scores after the residential intervention at T2 and tend some of them tend to diminish after 3-months of follow up. The table 2 shows the correlation between the measured variables at the baseline.

The internal consistencies, Cronbach's alpha for various questionnaires used in this study were: 0.89 for Mindfulness Attention Awareness Scale, 0.85 for Negative Affect of PANAS, 0.82 for Positive Affect of PANAS scale, 0.70 for perceived stress scale, 0.69 for ERQ Reappraisal, and 0.63 for ERQ Suppression.

Table 6.5 : Study2 - Baseline characteristics – mean and std. deviation

Mean and standard deviations of dependent variables at baseline (T1), after residential intervention (T2), and after 3-months follow up (T3)

Variable	T1 (n=77)		T2 (n=77)		T3 (n=61)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Mindfulness	4.1	0.87	4.43	0.87	4.59	0.8
2. Reappraisal	27.83	6.36	30.61	6.47	28.93	6.9
3. Suppression	16.25	4.57	16.32	4.83	16.34	5.03
4. Positive Affect	36.05	6.44	42.56	5.66	38.57	7.23
5. Negative Affect	20.51	7.07	15.19	4.92	17.92	6.22
6. Perceived Stress	15.87	5.02	14.17	5.98	14.00	5.67

Table 6.6 : Study2 - Baseline characteristics – correlations
Correlations with 95% confidence intervals of all the variables at baseline

Variable	1	2	3	4	5
1. Mindfulness_T1					
2. Reappraisal_T1	.22 [-.01, .42]				
3. Suppression_T1	-.11 [-.32, .12]	.32** [.11, .51]			
4. Positive Affect_T1	.28* [.06, .48]	.23* [.01, .44]	-.02 [-.25, .20]		
5. Negative Affect_T1	-.43** [-.60, -.23]	-.26* [-.46, -.04]	-.04 [-.26, .18]	-.10 [-.31, .13]	
6. PSS_T1	-.49** [-.64, -.30]	.04 [-.19, .26]	.08 [-.14, .30]	-.25* [-.45, -.03]	.52** [.34, .67]

Note. * indicates $p < .05$. ** indicates $p < .01$.

It shows that mindfulness has significant positive correlation with positive affect, and significant negative correlation with negative affect and perceived stress. Similarly, negative and positive affect were significantly correlated with perceived stress. Emotion regulation strategies were not found to be correlated with any of the variables.

6.2.2 Linear Mixed Effects Model

Linear mixed effects model was used as our design had some missing values and therefore, we had unbalanced repeated measures data. We performed the one-way repeated measures analysis using linear mixed effect model with Time (T1, T2, and T3) and the fixed factor and each of the measured variables as dependent variables one at a time. We used subject as a random factor in all these models. The results are presented in the table 3. Planned contrasts were done using paired sample t-test to test if the means have changed at T2 and T2 compared to the baseline T1. 0.05 was fixed as the level of statistical significance. The mindfulness score has changed significantly over three assessment points. The change after the residential program compared to baseline was significant, $t(76) = 3.83, p < .001, d = 0.44$, and the increase in the MAAS scores after the follow up compared to the baseline was also significant, $t(60) = 4.24, p < .001, d = 0.54$, where t is the t -statistic from paired samples t -test, p is the p -value of the statistic, and d is the Cohen's effect size. The Perceived Stress Scores (PSS) have reduced significantly after residential orientation compared to the baseline, $t(76) = -3.50, p < .001, d = -0.40$, and there was a decrease after the follow up compared to the baseline, $t(60) = -1.83, p = .072, d = -0.23$. The ERQ-Reappraisal scores have improved significantly after residential orientation compared to baseline, $t(76) = 2.97, p = .004, d = 0.34$, the increase after the follow up compared to the baseline was not significant, $t(60) = 0.95, p = .347, d = 0.12$, showing that the ERQ-Reappraisal scores have little regressed.

Table 6.7: Repeated measures results using linear mixed effects model

		Value	Std.Error	DF	t-value	p-value
Baseline	(Intercept)	4.34	0.08	138	51.98	< .001
Model 1	(Intercept)	4.10	0.10	136	42.50	< .001
MAAS	TIMemaasmean2	0.33	0.09	136	3.78	< .001
	TIMemaasmean3	0.45	0.09	136	4.78	< .001
Comparison of model Fit:				$\chi^2(2) = 24.30, p < .001$		
Baseline	(Intercept)	14.83	0.53	138	27.81	< .001
Model 2	(Intercept)	15.87	0.63	136	25.07	< .001
PSS	TIMepsstot2	-1.70	0.60	136	-2.82	0.006
	TIMepsstot3	-1.54	0.66	136	-2.36	0.020
Comparison of model Fit:				$\chi^2(2) = 9.22, p = .01$		
Baseline	(Intercept)	29.12	0.53	138	55.14	< .001
Model 2	(Intercept)	27.83	0.75	136	37.21	< .001
ERQ-Reappraisal	TIMereapptot2	2.78	0.93	136	2.98	0.003
	TIMereapptot3	1.02	1.00	136	1.02	0.311
Comparison of model Fit:				$\chi^2(2) = 8.90, p = .012$		
Baseline	(Intercept)	16.29	0.43	138	37.89	< .001
Model 2	(Intercept)	16.25	0.55	136	29.70	< .001
ERQ-Suppression	TIMesupptot2	0.08	0.60	136	0.13	0.896
	TIMesupptot3	0.07	0.64	136	0.11	0.916
Comparison of model Fit:				$\chi^2(2) = 0.02, p = .99$		
Baseline	(Intercept)	39.08	0.58	138	67.43	< .001
Model 2	(Intercept)	36.05	0.73	136	49.30	< .001
PANAS-Positive	TIMEposaffect2	6.51	0.78	136	8.31	< .001
	TIMEposaffect3	2.39	0.85	136	2.82	0.006
Comparison of model Fit:				$\chi^2(2) = 57.52, p < .001$		
Baseline	(Intercept)	17.89	0.49	138	36.30	< .001
Model 2	(Intercept)	20.51	0.70	136	29.40	< .001
PANAS-Negative	TIMeneg affect2	-5.31	0.87	136	-6.09	< .001
	TIMeneg affect3	-2.48	0.94	136	-2.65	0.009
Comparison of model Fit:				$\chi^2(2) = 33.34, p < .001$		

Note. MAAS= Mindfulness Attention Awareness Scale, ERQ= Emotion Regulation

Questionnaire, PANAS= Positive and Negative Affect Scale

The ERQ-Suppression scores have increased after residential program compared to the baseline, but the change was not statistically significant, $t(76) = 0.15, p = .881, d = 0.02$, and the scores increased after the follow up compared to the baseline, but again statistically non-significant, $t(60) = 0.32, p = .752, d = 0.04$. The PANAS Positive Affect scores have increased significantly after residential orientation compared to the baseline $t(76) = 8.92, p < .001, d = 1.02$, and there was an increase after the follow up compared to the baseline which was not statistically significant, $t(60) = 2.28, p = .026, d = 0.29$. The Negative Affect scores decreased significantly after residential orientation compared to the baseline, $t(76) = -5.56, p < .001, d = -0.65$, and there was a non-significant decrease after the follow up compared to the baseline, $t(60) = -1.89, p = .064, d = -0.24$.

Table 6.8: Study2 – Paired sample t test results

	Mindfulness	Perceived Stress	Reappraisal	Suppression	Positive Affect	Negative Affect
Residential	$t(76) = 3.83,$ $p < .001^*,$ $d = 0.44$	$t(76) = -3.50,$ $p < .001^*,$ $d = -0.40$	$t(76) = 2.97,$ $p = .004^*,$ $d = 0.34$	$t(76) = 0.15,$ $p = .881,$ $d = 0.02$	$t(76) = 8.92,$ $p < .001^*,$ $d = 1.02$	$t(76) = -5.56,$ $p < .001^*,$ $d = -0.65$
Follow Up	$t(60) = 4.24,$ $p < .001^*,$ $d = 0.54$	$t(60) = -1.83,$ $p = .072,$ $d = -0.23$	$t(60) = 0.95,$ $p = .347,$ $d = 0.12$	$t(60) = 0.32,$ $p = .752,$ $d = 0.04$	$t(60) = 2.28,$ $p = .026^*,$ $d = 0.29$	$t(60) = -1.89,$ $p = .064,$ $d = -0.24$

t is the *t*-statistic from paired samples *t*-test, *p* is the *p*-value of the statistic, and *d* is

the Cohen's effect size; * indicates $p < .001$

6.2.3 Mediating Effect of Mindfulness

We conducted a mediation analysis using nonparametric bootstrap method with the mediation package of R statistical software (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014). We used a simple mediation model in which Perceived Stress was the dependent variable, Positive Affect was the independent variable, and Mindfulness was the mediator. The Average Direct Effect was not significant ($b = -0.095$, $p = .312$), Average Causal Mediation Effect was significant ($b = -0.100$, $p = .008$), Total Effect was also significant ($b = -0.195$, $p = .036$). Proportion of mediation was found to be 51.4%.

Even though the emotion regulation did not have any affect on the perceived stress, it was observed that the perception of stress was quite different across the levels of mindfulness. We derived four categories using the standardized z scores of reappraisal and suppression domains of emotion regulation scale. We considered participants with $z > 0$ on both reappraisal and suppression to be using both the strategies when reappraisal score was > 0 and suppression score was < 0 then it is considered as using only one strategy predominantly, i.e., reappraisal. Similarly, for suppression, the z score was < 0 and suppression score was > 0 . Finally, when both the domain scores were less than 0, then it was considered as following no specific strategy. Figure 1 depicts the difference in perceived stress across high and low mindfulness and categories of emotional regulation. This shows that people with lower levels of mindfulness tend to have higher stress compared to people with higher levels of mindfulness.

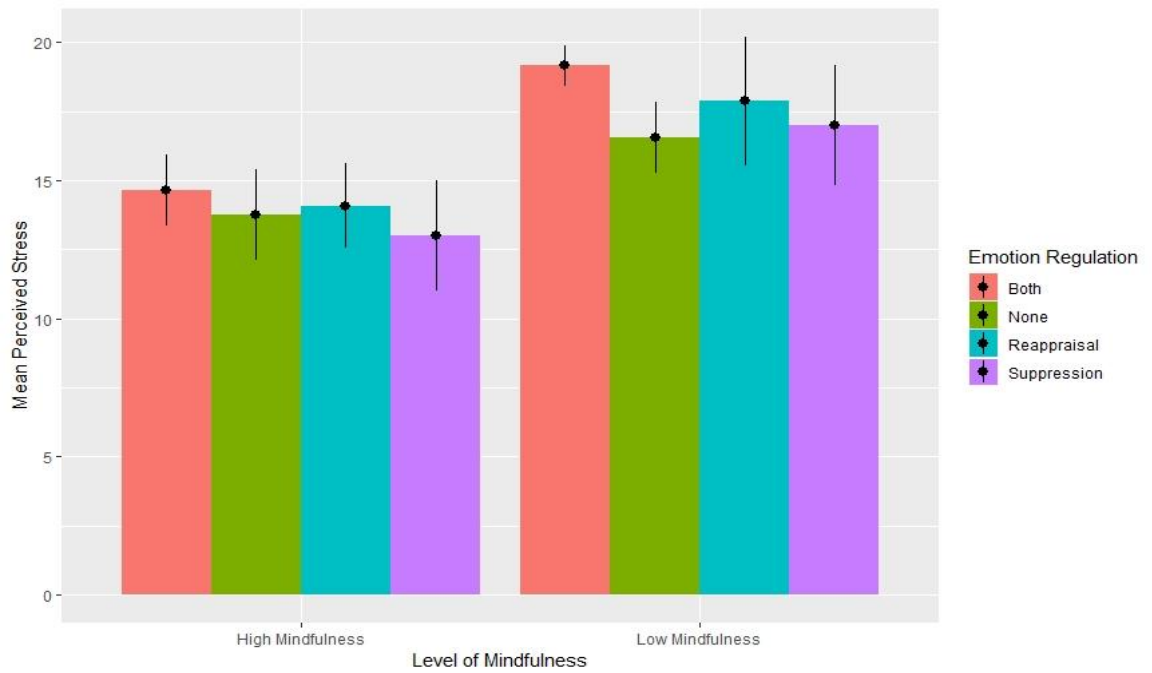


Figure 6.1: Effect of Mindfulness and Emotion Regulation on Perceived Stress

6.3 RESULTS – COMBINED VIEW

In the following graphs, X-axis represents the various time points of measurement (T1, T2, T3) and Y-axis represents the measured variable scores at these time points. T1, T2, T3 represent correspondingly, the scores at baseline, post the 5 day residential intervention, and post 3 months of follow-up home practice.

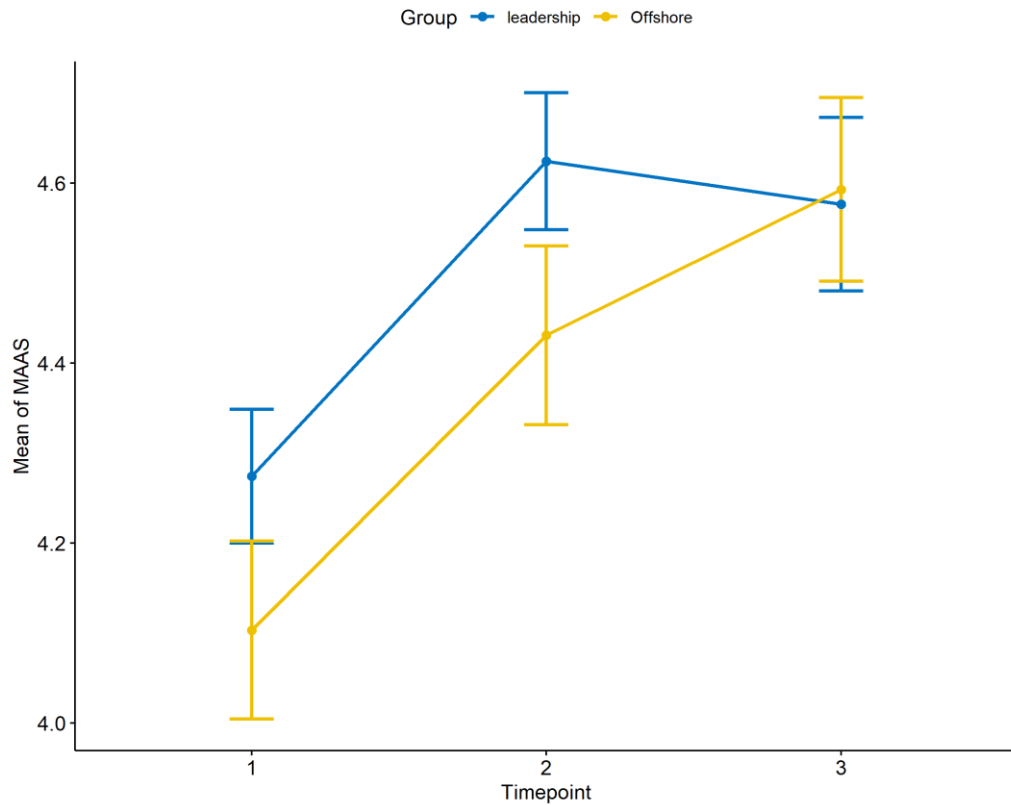


Figure 6.2: Mindfulness – combined study results

The figure shows that mindfulness has increased at both time points, viz. T2 and T3, corresponding to baseline T1. This increase happened for both the leadership and offshore study groups. For leadership, the mindfulness score after follow-up has reduced a bit compared to post the residential intervention, even though this score is higher than the baseline T1. The vertical line represents the standard error.

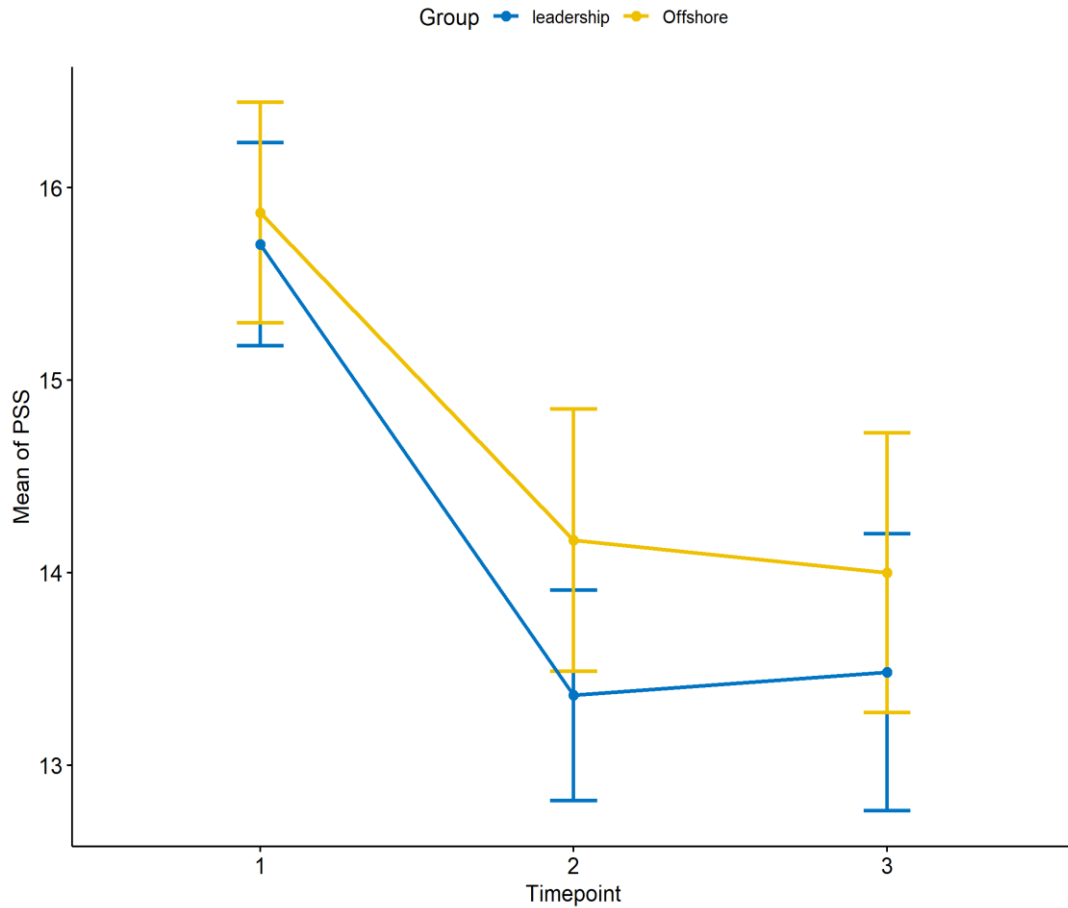


Figure 6.3: Perceived stress – combined study results

The figure shows that perceived stress has reduced at both time points, viz. T2 and T3, corresponding to baseline T1. This decrease happened for both the leadership and offshore study groups. For leadership group, the perceived stress score after follow up has increased a bit, compared to post the residential intervention, even though this score is lower than the baseline T1. For offshore group, the perceived stress score after follow up has further decreased a bit, compared to post the residential intervention. The vertical line represents the standard error.

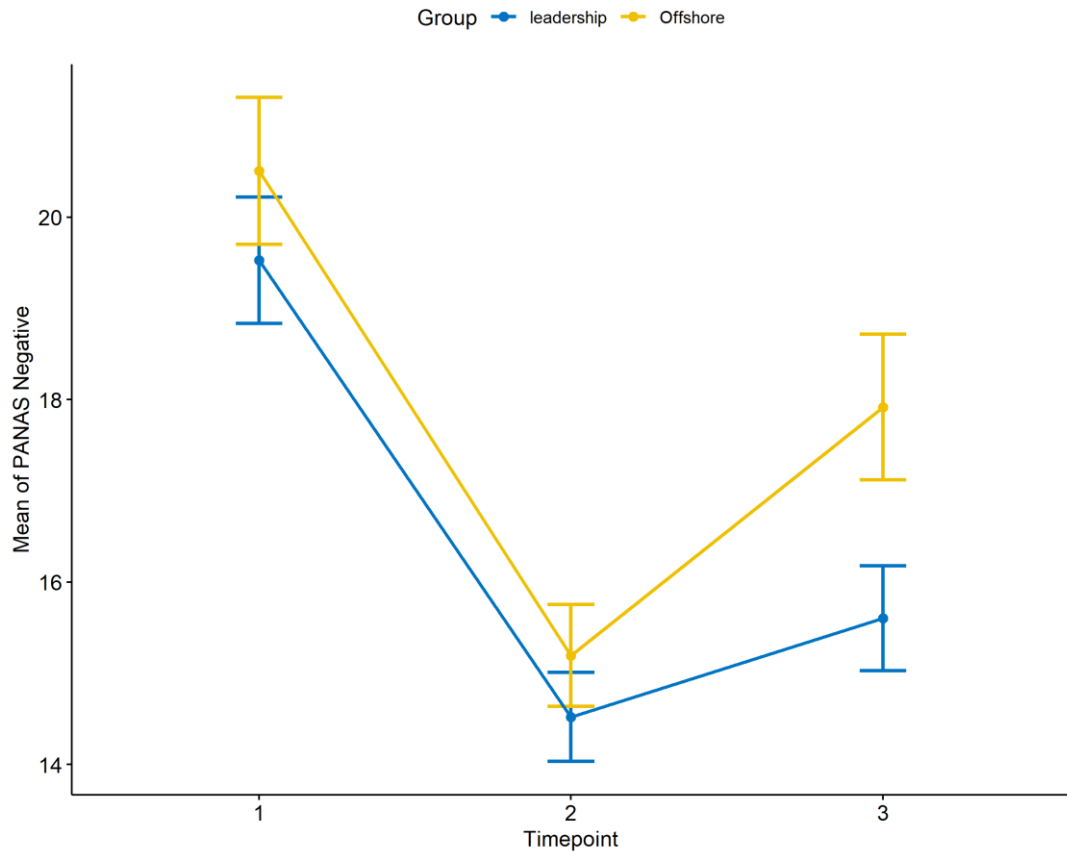


Figure 6.4: Negative Affect – combined study results

The figure shows that the negative affect score has reduced at both time points, viz. T2 and T3, corresponding to baseline T1. This decrease happened for both the leadership and offshore study groups. For both leadership and offshore groups, the negative affect score after follow up has increased, compared to post the residential intervention, even though this score is lower than the baseline T1. The vertical line represents the standard error.

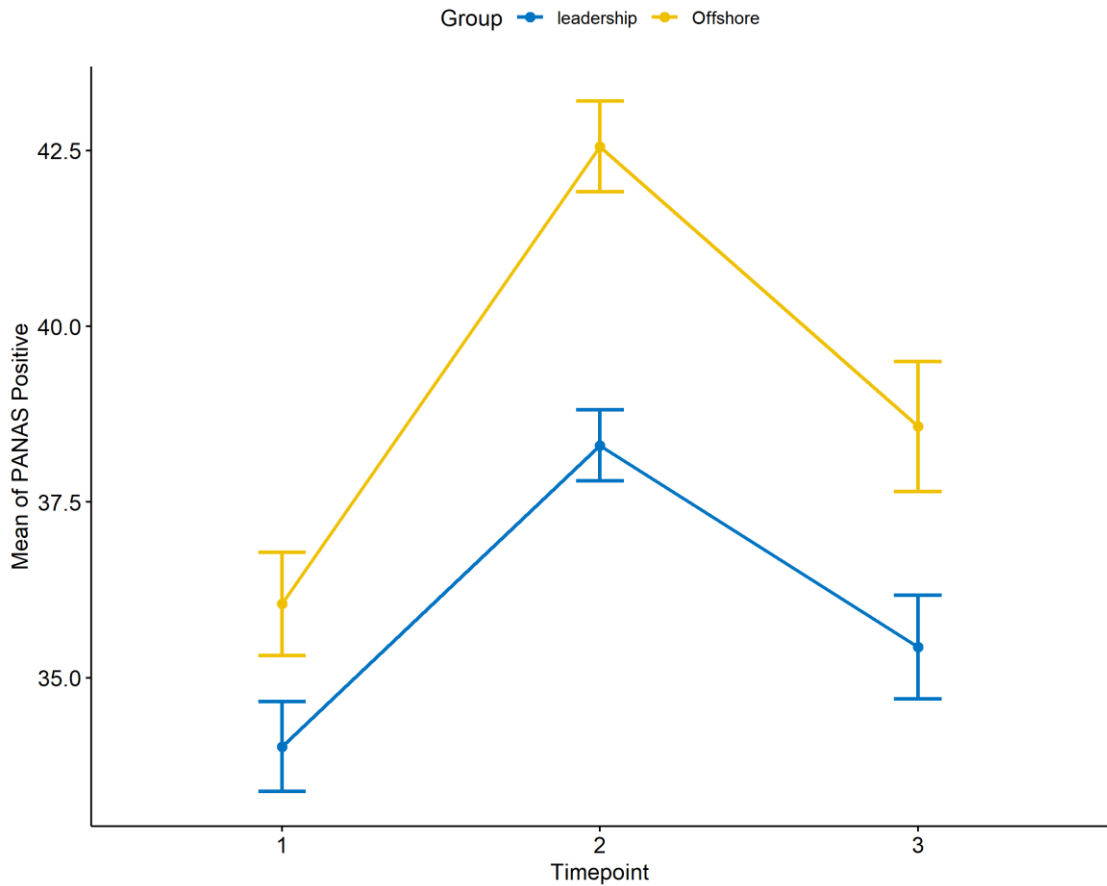


Figure 6.5: Positive Affect – combined study results

The figure shows that the positive affect score has increased at both time points, viz. T2 and T3, corresponding to baseline T1. This increase happened for both the leadership and offshore study groups. However, for both leadership and offshore study groups, the positive affect score after follow-up has reduced compared to post the residential intervention, even though this score is higher than the baseline T1. The vertical line represents the standard error.

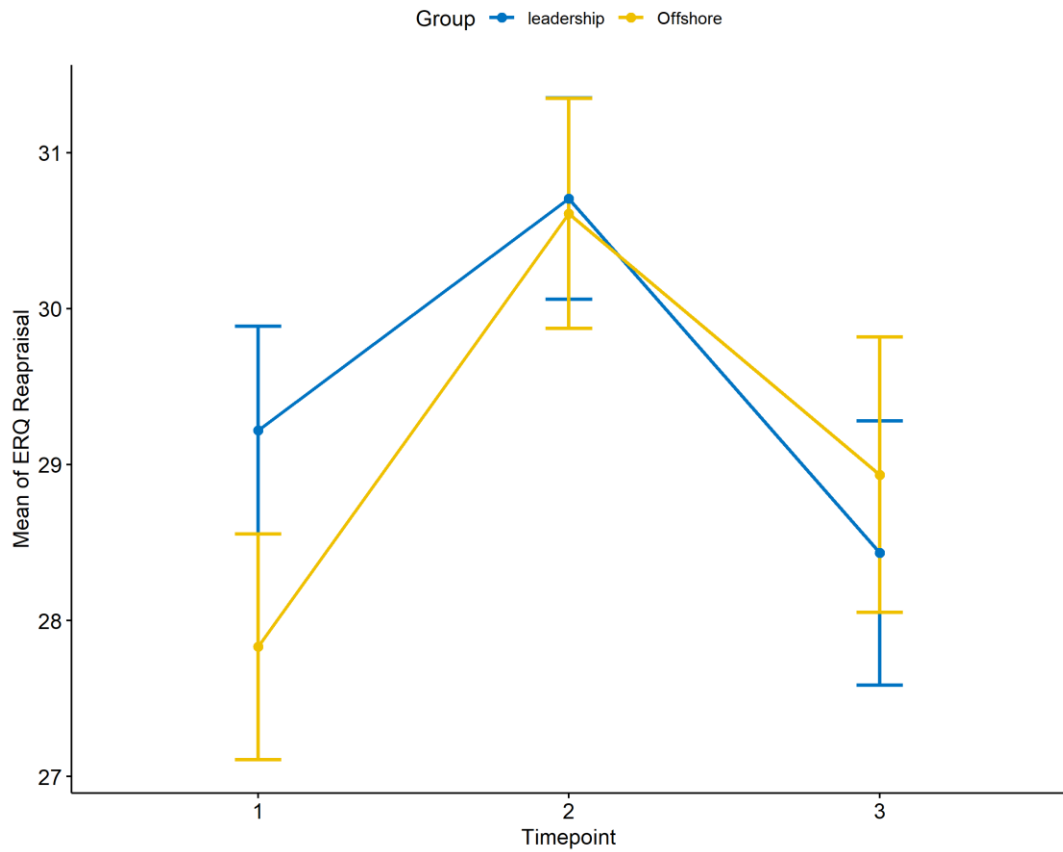


Figure 6.6: Reappraisal – combined study results

The figure shows that the reappraisal score has increased at both time points, viz. T2 and T3, corresponding to baseline T1. This increase happened for both the leadership and offshore study groups. However, for both leadership and offshore study groups, the reappraisal score after follow-up has reduced compared to post the residential intervention, even though this score is higher than the baseline T1. The vertical line represents the standard error.

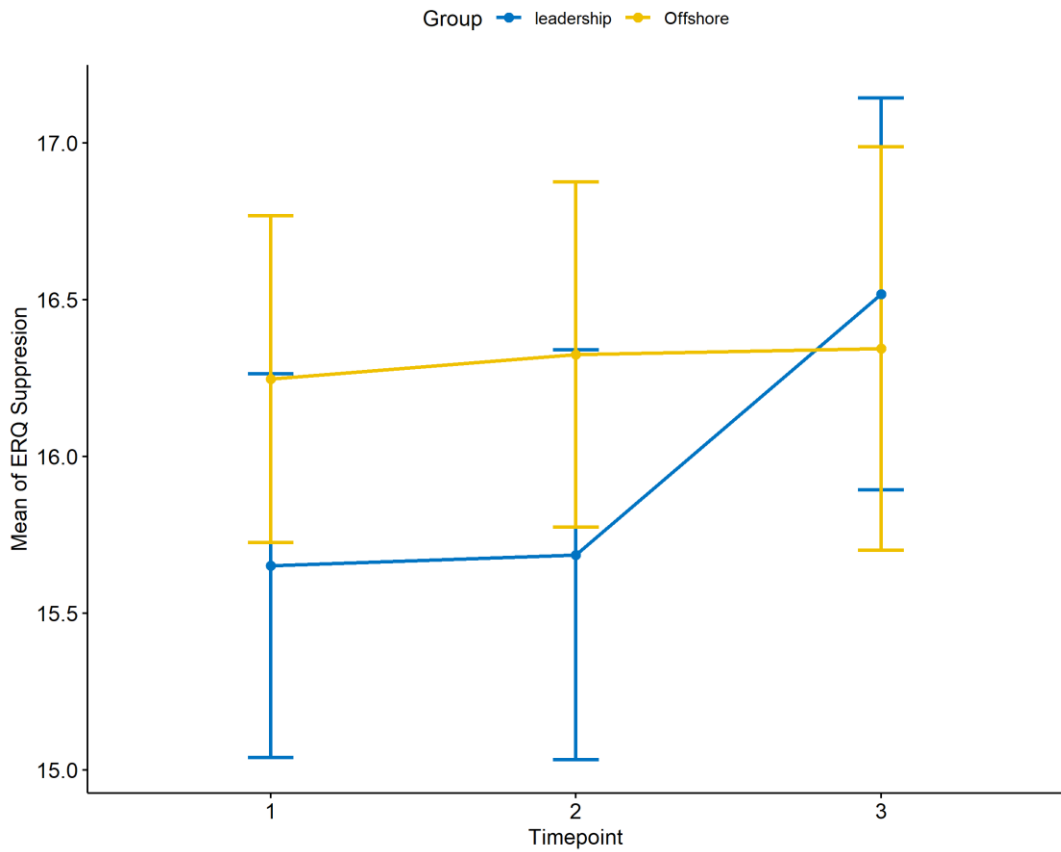


Figure 6.7: Suppression – combined study results

The figure shows that the suppression score has increased at both time points, viz. T2 and T3, corresponding to baseline T1. This increase happened for both the leadership and offshore study groups. For both leadership and offshore study groups, the suppression score after follow-up has further increased compared to post the residential intervention, with the leadership group showing a much higher increase in suppression than the offshore group. The vertical line represents the standard error.