**Table 4**

*Means and Changes Scores on the Sleep Diary According to Group and Time*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Means (SDs), by time and change scores | | | | Comparisons between groups | | | | |
| Time or change | ACT (*n*=76) | CBT (*n*=76) | WL(*n=*75) |  | Beta [95% CI] | *p*-value | *d* |  |
| SOL (min) |  |  |  |  |  |  |  |  |
| t1 (pre) | 45.30 (29.69) | 47.70 (35.39) | 47.16 (42.71) | ACT vs. CBT× t2-t1 | 0.57 [0.3, 0.84] | <.001 |  | ACT < CBT |
| t2 (post) | 34.15 (38.82) | 18.42 (15.94) | 35.21 (39.60) | ACT vs. CBT × t3-t1 | 0.3 [0.02, 0.58] | 0.037 |  | ACT < CBT |
| t3 (FU6) | 28.50 (29.23) | 22.02 (21.52) | 35.11 (32.23) |  |  |  |  |  |
| Change t1-t2 (SE) | 11.17 (3.99)\* | 29.71 (4.14)\*\*\* | 11.95 (3.85)\*\* | ACT vs. WL × t2-t1 | -0.06 [-0.32, 0.21] | 0.679 |  | ACT = WL |
| Change t1-t3 (SE) | 16.48 (4.10)\*\*\* | 24.93 (4.26)\*\*\* | 11.40 (4.40)\* | ACT vs. WL × t3-t1 | -0.26 [-0.54, 0.02] | 0.07 |  | ACT = WL |
| Change t2-t3 (SE) | 16.48(4.10)\*\*\* | -4.79 (4.28) | -.55 (4.40) |  |  |  |  |  |
| WASO (min) |  |  |  |  |  |  |  |  |
| t1 (pre) | 25.98 (22.24) | 36.01 (34.84) | 31.16 (29.47) | ACT vs. CBT × t2-t1 | 0.6 [0.2, 1.01] | 0.003 |  | ACT < CBT |
| t2 (post) | 21.90 (23.15) | 15.57 (20.62) | 25.34 (26.97) | ACT vs. CBT × t3-t1 | 0.09 [-0.33, 0.5] | 0.677 |  | ACT = CBT |
| t3 (FU6) | 17.17 (28.30) | 19.23 (24.42) | 22.11 (25.41) |  |  |  |  |  |
| Change t1-t2 (SE) | 4.18 (3.17) | 20.59 (3.30)\*\*\* | 5.82 (3.07) | ACT vs. WL × t2-t1 | -0.02 [-0.41, 0.36] | 0.904 |  | ACT = WL |
| Change t1-t3 (SE) | 8.98 (3.26)\* | 16.40 (3.39)\*\*\* | 9.30 (3.50)\* | ACT vs. WL × t3-t1 | -0.17 [-0.59, 0.25] | 0.423 |  | ACT = WL |
| Change t2-t3 (SE) | 4.80 (3.27) | -4.19 (3.41) | 3.48 (3.50) |  |  |  |  |  |
| TST (min) |  |  |  |  |  |  |  |  |
| t1 (pre) | 360.23 (60.89) | 362.84 (68.13) | 361.98 (59.08) | ACT vs. CBT × t2-t1 | 8.55 [-11.11, 28.22] | .394 |  | ACT = CBT |
| t2 (post) | 389.38 (60.59) | 384.74 (61.92) | 375.88 (70.42) | ACT vs. CBT × t3-t1 | 1.04 [-19.2, 21.27] | .92 |  | ACT = CBT |
| t3 (FU6) | 400.30 (62.23) | 403.78 (68.97) | 369.93 (75.66) |  |  |  |  |  |
| Change t1-t2 (SE) | -29.31 (7.02)\*\*\* | -20.76 (7.29)\*\* | -13.90 (6.77) | ACT vs. WL × t2-t1 | 15.41 [-3.55, 34.37] | .111 |  | ACT = WL |
| Change t1-t3 (SE) | -39.30 (7.21)\*\*\* | -38.26 (7.51)\*\*\* | -12.07 (7.76) | ACT vs. WL × t3-t1 | 27.22 [6.64, 47.81] | .01 |  | ACT > WL |
| Change t2-t3 (SE) | -9.99 (7.22) | -17.51 (7.53)\* | 1.82 (7.76) |  |  |  |  |  |
| SE (%) |  |  |  |  |  |  |  |  |
| t1 (pre) | 71.03 (12.15) | 72.60 (10.76) | 72.30 (12.11) | ACT vs. CBT × t2-t1 | -0.52 [-.78, -.27] | <.001 |  | ACT < CBT |
| t2 (post) | 80.29 (13.54) | 88.07 (7.92) | 75.56 (12.71) | ACT vs. CBT × t3-t1 | -0.05 [-0.31, 0.2] | .685 |  | ACT = CBT |
| t3 (FU6) | 82.16 (13.40) | 84.25 (12.42) | 75.63 (13.03) |  |  |  |  |  |
| Change t1-t2 (SE) | -9.20 (1.29)\*\*\* | -15.37 (1.34)\*\*\* | -3.26 (1.24)\* | ACT vs. WL × t2-t1 | 0.34 [.11, .56] | .003 |  | ACT > WL |
| Change t1-t3 (SE) | -10.93 (1.32)\*\*\* | -11.08 (1.38)\*\*\* | -3.46 (1.42)\* | ACT vs. WL × t3-t1 | 0.47 [.22, .72] | <.001 |  | ACT > WL |
| Change t2-t3 (SE) | -1.73 (1.33) | 4.29 (1.38)\*\* | -.20 (1.42) |  |  |  |  |  |
| SS (%) |  |  |  |  |  |  |  |  |
| t1 (pre) | 28.88 (23.31) | 30.45 (17.35) | 32.03 (19.77) | ACT vs. CBT × t2-t1 | -0.27 [-0.64, 0.1] | .157 |  | ACT = CBT |
| t2 (post) | 44.00 (24.67) | 52.47 (21.13) | 33.91 (24.09) | ACT vs. CBT × t3-t1 | -0.09 [-0.48, 0.3] | .645 |  | ACT = CBT |
| t3 (FU6) | 55.19 (24.56) | 59.88 (22.55) | 34.68 (20.41) |  |  |  |  |  |
| Change t1-t2 (SE) | -.15 (.03)\*\*\* | -.22 (.03)\*\*\* | -.02 (.03) | ACT vs. WL × t2-t1 | 0.69 [0.33, 1.05] | <.001 |  | ACT > WL |
| Change t1-t3 (SE) | -.26 (.03)\*\*\* | -.29 (.03)\*\*\* | -.04 (.03) | ACT vs. WL × t3-t1 | 1.11 [0.72, 1.51] | <.001 |  | ACT > WL |
| Change t2-t3 (SE) | -.11 (.03)\*\*\* | -.07 (.03)\*\* | -.02 (.03) |  |  |  |  |  |

*Note*. SOL = sleep onset latency; WASO = wake after sleep onset; TST = total sleep time; SE = sleep efficiency; SS = sleep satisfaction; ACT = acceptance and commitment therapy; CBT = cognitive behavior therapy; WL = waitlist; FU6 = follow-up six month; SD = standard deviation; CI = confidence interval; d = effect size Cohen’s d. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 5**

*Means and Changes Scores on the Secondary Outcomes According to Group and Time*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Means (SDs), by time and change scores | | | | Comparisons between groups | | | | |
| Time or change | ACT (*n*=76) | CBT (*n*=76) | WL(*n=*75) |  | Beta [95% CI] | *p*-value | *d* |  |
| HADS-D |  |  |  |  |  |  |  |  |
| t1 (pre) | 8.63 (4.09) | 8.11 (3.86) | 8.33 (3.86) | ACT vs. CBT× t2-t1 | -.07 [-.34, .20] | .609 | -.05 | ACT = CBT |
| t2 (post) | 5.98 (3.36) | 5.51 (4.13) | 7.75 (4.32) | ACT vs. CBT × t3-t1 | .07 [-.20, .34] | .609 | .05 | ACT = CBT |
| t3 (FU6) | 6.11 (3.65) | 5.07 (3.47) | 7.55 (4.37) |  |  |  |  |  |
| Change t1-t2 (d) | 2.59 (.67)\*\*\* | 2.30 (.57)\*\*\* | .63 (.17) | ACT vs. WL × t2-t1 | -.48 [-.74, -.22] | < .001 | -.37 | ACT > WL |
| Change t1-t3 (d) | 2.39 (.61)\*\*\* | 2.68 (.65)\*\*\* | .85 (.23) | ACT vs. WL × t3-t1 | -.38 [-.64, -.12] | .005 | -.29 | ACT > WL |
| Change t2-t3 (d) | -.20 (-.05) | .37 (.09) | .22 (.06) |  |  |  |  |  |
| HADS-A |  |  |  |  |  |  |  |  |
| t1 (pre) | 9.89 (3.91) | 10.2 (3.74) | 11.3 (3.86) | ACT vs. CBT × t2-t1 | .13 [-.12, .39] | .309 | .10 | ACT = CBT |
| t2 (post) | 7.29 (3.19) | 7.16 (4.30) | 9.38 (4.44) | ACT vs. CBT × t3-t1 | .22 [-.04, .48] | .104 | .16 | ACT = CBT |
| t3 (FU6) | 7.22 (3.68) | 6.71 (3.83) | 9.19 (4.24) |  |  |  |  |  |
| Change t1-t2 (d) | 2.39 (.62)\*\*\* | 2.95 (.74)\*\*\* | 1.93 (.53)\*\*\* | ACT vs. WL × t2-t1 | -.11[-.36, .14] | .387 | -.09 | ACT = WL |
| Change t1-t3 (d) | 2.45 (.63)\*\*\* | 3.37 (.82)\*\*\* | 2.10 (.57)\*\*\* | ACT vs. WL × t3-t1 | -.08 [-.34, .17] | .520 | -.06 | ACT = WL |
| Change t2-t3 (d) | .06 (.02) | .41 (.10) | .18 (.05) |  |  |  |  |  |
| SAS |  |  |  |  |  |  |  |  |
| t1 (pre) | 26.31 (7.39) | 25.64 (7.90) | 26.13 (7.27) | ACT vs. CBT × t2-t1 | .14[-.10, .38] | .249 | .12 | ACT = CBT |
| t2 (post) | 20.03 (6.72) | 18.38 (6.64) | 24.65 (7.33) | ACT vs. CBT× t3-t1 | .13[-.11, .37] | .286 | .11 | ACT = CBT |
| t3 (FU6) | 19.19 (7.43) | 17.36 (7.92) | 25.03 (7.75) |  |  |  |  |  |
| Change t1-t2 (d) | 5.85 (.86)\*\*\* | 6.98 (.99)\*\*\* | 1.64 (.25)\* | ACT vs. WL × t2-t1 | -.52 [-.75, -.29] | < .001 | -.45 | ACT > WL |
| Change t1-t3 (d) | 6.61 (.96)\*\*\* | 7.68 (1.06)\*\*\* | 1.29 (.20) | ACT vs. WL × t3-t1 | -.66 [-.89, -.42] | < .001 | -.56 | ACT > WL |
| Change t2-t3 (d) | .76 (.11) | .70 (.10) | -.36 (-.05) |  |  |  |  |  |
| SPAQ |  |  |  |  |  |  |  |  |
| t1 (pre) | 17.69 (8.43) | 17.71 (8.19) | 17.23 (8.69) | ACT vs. CBT × t2-t1 | -.06[-.32, .20] | .657 | -.04 | ACT = CBT |
| t2 (post) | 26.64 (9.53) | 27.62 (8.52) | 20.86 (9.79) | ACT vs. CBT × t3-t1 | -.17[-.44, .09] | .195 | -.13 | ACT = CBT |
| t3 (FU6) | 27.69 (10.61) | 29.90 (8.73) | 20.25 (10.10) |  |  |  |  |  |
| Change t1-t2 (d) | -8.81 (-.93)\*\*\* | -9.42 (-.95)\*\*\* | -3.74 (-.41)\*\*\* | ACT vs. WL × t2-t1 | .49 [.24, .75] | < .001 | .39 | ACT > WL |
| Change t1-t3 (d) | -9.72 (-1.01)\*\*\* | -11.52 (-1.14)\*\*\* | -3.19 (-.35)\*\* | ACT vs. WL × t3-t1 | .64 [.38, .89] | < .001 | .49 | ACT > WL |
| Change t2-t3 (d) | -.90 (-.09) | -2.10 (-.21)\* | .56 (.06) |  |  |  |  |  |
| AAQ-II |  |  |  |  |  |  |  |  |
| t1 (pre) | 27.5 (9.38) | 27.5 (8.81) | 29.5 (9.18) | ACT vs. CBT × t2-t1 | .29[.05, .53] | .200 | .23 | ACT = CBT |
| t2 (post) | 23.4 (7.85) | 20.4 (9.75) | 26.2 (10.3) | ACT vs. CBT × t3-t1 | .31[.06, .55] | .015 | .24 | ACT < CBT |
| t3 (FU6) | 23.4 (9.40) | 19.9 (8.57) | 26.6 (10.4) |  |  |  |  |  |
| Change t1-t2 (d) | 3.35 (.40)\*\*\* | 6.15 (.71)\*\*\* | 3.31 (.42)\*\*\* | ACT vs. WL × t2-t1 | .003[-.24, .23] | .977 | -.003 | ACT = WL |
| Change t1-t3 (d) | 3.41 (.41)\*\*\* | 6.40 (.72)\*\*\* | 2.88 (.36)\*\*\* | ACT vs. WL × t3-t1 | -.05[-.29, .18] | .647 | -.05 | ACT = WL |
| Change t2-t3 (d) | .07 (.01) | .25 (.03) | -.44 (-.05) |  |  |  |  |  |
| DBAS-16 |  |  |  |  |  |  |  |  |
| t1 (pre) | 112 (23.1) | 111 (23.1) | 112 (25.9) | ACT vs. CBT × t2-t1 | .49 [.22, .75] | < .001 | .36 | CBT > ACT |
| t2 (post) | 81.9 (28.6) | 64.7 (34.7) | 105 (27.7) | ACT vs. CBT × t3-t1 | .57 [.31, .84] | < .001 | .42 | CBT > ACT |
| t3 (FU6) | 83.7 (33.8) | 62.5 (34.00) | 104 (27.9) |  |  |  |  |  |
| Change t1-t2 (d) | 28.96 (.91)\*\*\* | 45.53 (1.36)\*\*\* | 7.72 (.25)\* | ACT vs. WL × t2-t1 | -.62 [-.88, -.37] | < .001 | -.48 | ACT > WL |
| Change t1-t3 (d) | 27.34 (.85)\*\*\* | 46.87 (1.38)\*\*\* | 8.69 (.28)\* | ACT vs. WL × t3-t1 | -.55 [-.81, -.29] | < .001 | -.42 | ACT > WL |
| Change t2-t3 (d) | -1.63 (-.05) | 1.33 (.04) | .98 (.03) |  |  |  |  |  |

*Note*. HADS-D = Hospital Anxiety and Depression Scale-Depression; HADS-A = Hospital Anxiety and Depression Scale-Anxiety; SAS = Sleep Acceptance Scale; SPAQ = Sleep Problem Acceptance Questionnaire; AAQ-II = Acceptance Action Questionnaire-II; DBAS = Dysfunctional Beliefs and Attitudes About Sleep; ACT = acceptance and commitment therapy; CBT = cognitive behavior therapy; WL = waitlist; FU6 = follow-up six month; SD = standard deviation; CI = confidence interval; d = effect size Cohen’s d. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001

**Table 6**

*Adherence and Satisfaction to Treatment*

| Question | ACT-I (n*=66)* | CBT-I (*n*=61) | *p* |
| --- | --- | --- | --- |
| Comprehension = yes, *n* (%) | 59 (89) | 49 (80) | .23 |
| Commitment = yes, *n* (%) | 63 (95) | 60 (98) | .66 |
| Motivation = yes, *n* (%) | 63 (95) | 54 (88) | .26 |
| Compliance = completely, *n* (%) | 25 (38) | 35 (57) | .04 |
| Resilience = yes, *n* (%) | 60 (92) | 53 (87) | .48 |
| Satisfaction = yes, *n* (%) | 61 (92) | 54 (88) | .65 |
| Recommendation = yes, *n* (%) | 64 (100) | 56 (92) | .06 |
| Overall impression = positive, *n* (%) | 63 (95) | 56 (92) | .63 |

*Note*. ACT = acceptance and commitment therapy; CBT = cognitive behavior therapy.