fact that, regarding depression and symptoms of affective and/ or behavioural dysregulation, participants of both BLT conditions improved significantly after two weeks of BLT.

In addition, we exclusively focused on the mere severity of the disorder, not taking into account subtypes of depression, underlying mechanisms and causal explanations for depressive symptoms. By incorporating causal explanations for depressive disorders one can assume that depressions arising from psychosocial difficulties might benefit more from CBT, focusing on the correction of maladaptive thinking and negative lifestyle patterns (Boyce & Barriball, 2010). On the other side, “biologically caused depression” or depression with a seasonal aspect might benefit to a greater extent by influencing circadian functioning with light. It was, for example, shown that for non-seasonal depression modifying circadian functioning and the neurotransmitter system by administering BLT, tryptophan depletion-mediated depression can be prevented by interacting with serotonin function (aan het Rot et al., 2008).

Other minor limitations include interruption by weekend breaks, and lack of daily mood self-assessments that would allow a more detailed picture of responses to BLT. The effects of BLT soon vanish after treatment has stopped. Therefore, it is crucial to continue BLT on a maintenance basis at home. Unfortunately, due to the pilot character of the study, maintenance treatment was not an option in this sample.

3.7 Conclusion and Future Perspective

Overall, based on the results that were presented in this thesis, one might conclude that two weeks of add-on morning BLT do not directly influence depressive symptoms or symptoms of affective and behavioural dysregulation. However, sleep quality, sleep restoration and circadian preference seem to be beneficially influenced. Improved sleep and a circadian phase advance seem to be associated with or are of predictive value for improved depression and improved symptoms of affective and behavioural dysregulation. It seems
likely that some limitations in our study regarding our sample (e.g. treatment duration, sample size, concomitant CBT, severity of depression, the inpatient care setting) might have led to this negative outcome on depression and symptoms of affective and behavioural dysregulation.

Thus, regarding the high co-morbidity of depression and sleep disorders, one might consider adding other chronotherapeutical interventions such, for example, wake therapy which has shown to be a feasible treatment approach for depressive adolescent inpatients in a first clinical trial and which might strengthen the effects on depression (Gest et al., 2015). Additionally, in future studies it seems essential to monitor long-term effects of BLT to follow-up secondary effects of a circadian phase advance. It can be assumed that more time is needed for a phase advance to positively affect depressive symptoms and affective and behavioural dysregulation (Gau et al., 2007; Goldstein et al., 2007; Lange & Randler, 2011; Van der Heijden et al., 2013). Also, future studies may need to prolong the duration of exposure to BLT with larger adolescent samples to replicate the presented results. Since the average length of stay in a hospital may not permit more than two weeks of BLT in many inpatients, BLT should be extended to the subsequent outpatient setting to prevent the disappearance of the acute effects of treatment. Furthermore, to get a more complete picture of the effects of BLT on adolescents with depressive symptoms, and/ or symptoms of affective and behavioural dysregulation, external ratings of symptoms, and objective measures such as polysomnography should be incorporated, which have proven feasibility in adolescents in intensive psychiatric care settings (Shahid et al., 2012). Due to reduced recall bias, also sleep diaries might provide more accurate estimates of self-reported sleep than surveys do (Buysse, Ancoli-Israel, Edinger, Lichstein, & Morin, 2006; Gradisar et al., 2011; Wyatt, 2004), and which have shown high correlations with objective measures of sleep (Wilson, Watson, & Currie, 1998; Wolfson et al., 2003).
Despite of the importance of effective treatments for juvenile depression and symptoms of affective and behavioural dysregulation, chronotherapeutical interventions, such as BLT, are off the list for insurance reimbursement. One might assume that it is the simplicity of treatment that contrasts with high-tech medicine which leads to the fact that they are often not taken seriously (Wirz-Justice, 2010). It is to be highlighted that BLT is a cost-effective, easy-to-apply method, and compatible with other interventions (psychotherapeutic interventions, antidepressant treatment, and wake therapy). Combining different interventions might accelerate improvements, minimize residual symptoms, prevent relapses, and expedite hospital discharges (Wirz-Justice et al., 2009), which is a highly desirable outcome for depressive adolescents.