

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

Title (Provisional)

The relationship between emotion dysregulation and sleep in children and adolescents with ADHD: protocol for a systematic review

Authors

Sørensen, Lin; Jensen, Daniel; Lykkebø, Amalie; Adolfsdottir, Steinunn; Holmen, Nina; Becker, Stephen P.; Flo, Elisabeth

VERSION 1 - REVIEW

Reviewer	1
Name	Frick, Matilda
Affiliation	Stockholm University
Date	27-Jan-2025
COI	None

Review of bmjopen-2025-099096

Thank you for giving me the opportunity to review this protocol. The protocol is in most regards clear, adhere to recommended procedures, and covers a topic that needs more scrutiny. Here are some issues that would clarify the plan further:

Comment 1: Page 6; unclear sentence: "Both EDR and sleep problems may be causal traits of ADHD and not specifically related with each other as observed in neurotypical children and adolescents". It is not clear what the authors refer to. Do they mean that EDR and sleep are causally related in neurotypical children but not in individuals with ADHD? Please clarify.

Comment 2: Page 6; "The primary research question is if EDR and poorer, insufficient, or misaligned sleep is co-dependent on each other beyond what can be explained by having an ADHD." How will this be examined? I am not convinced that the described methodology estimates this.

Comment 3: Page 6 and 8; "iv) whether studies have controlled for use of CNS medications-, and v) whether studies have controlled for comorbid psychiatric disorders in their study design and/statistical analyses". To me this sounds as a descriptive question that can be

answered yes/no. Are the authors not interested in the effect sizes of the associations when these factors are controlled for?

Comment 4: Page 8; Here the authors state that neurotypical controls will be included. What measures from controls will be examined and reported?

Comment 5: Page 9; "Any disagreement will be resolved by an independent "third" investigator." Does this refer to initial disagreement or disagreement after discussion between the primary investigators?

Reviewer	2
Name	Fibert, Philippa
Affiliation	Queen Mary University of London, Sport, Health and Applied Science
Date	14-Mar-2025
COI	None

There is no mention in the Introduction section of previous reviews of the triad of EMD, sleep and ADHD, and what new knowledge will be provided by this review compared to previous reviews. A brief description of other reviews and their findings is needed. This protocol appears similar to a published Masters thesis by one of the authors (Amalie Lykkebø). Please explain how this review builds upon Amalie Lykkebø's previous work, and that of previous reviews, and what novel information it will provide.

I do not think we need a detailed description of the 5 secondary research questions in the Introduction section. These are then repeated in less detail under 'Outcomes'. I suggest using the Introduction descriptions in the 'Outcomes' section as they are clearer. In the Introduction, summarise briefly, but better describe the rationale for these secondary research questions.

Regarding study limitations, I found this phrase in the summary: " limitation is that we will predominantly include peer-reviewed studies." However I could not find it in the text, nor any explanation as to what makes it a limitation.

I note that this study started in February, therefore any revision to the methodology is inappropriate.

The English is mostly fine. However inappropriate use of prepositions and plurals inhibits the flow. I suggest the document is proof read by a native English speaker.

VERSION 1 - AUTHOR RESPONSE

Reviewer: 1

Prof. Matilda Frick, Stockholm University

Comments to the Author:

Thank you for giving me the opportunity to review this protocol. The protocol is in most regards clear, adhere to recommended procedures, and covers a topic that needs more scrutiny. Here are some issues that would clarify the plan further:

Response:

Thank you for the positive review of our protocol manuscript. We are grateful for your suggestions in how to improve the manuscript. This is very helpful for when we conduct the systematic review.

Comment 1: Page 6; unclear sentence: "Both EDR and sleep problems may be causal traits of ADHD and not specifically related with each other as observed in neurotypical children and adolescents". It is not clear what the authors refer to. Do they mean that EDR and sleep are causally related in neurotypical children but not in individuals with ADHD? Please clarify.

Response:

We agree with the reviewer that this sentence was not clear and have now removed this statement from the manuscript.

Comment 2: Page 6; "The primary research question is if EDR and poorer, insufficient, or misaligned sleep is co-dependent on each other beyond what can be explained by having an ADHD." How will this be examined? I am not convinced that the described methodology estimates this.

Response:

We agree with the reviewer that our research question is not defined operationally in how to be investigated. The primary aim of our systematic review is to investigate if we will find the same effect sizes for the relationship between EDR and sleep problems in ADHD as is otherwise reported in populations without ADHD. It appears

that the effect size of the relation between EDR and sleep is on average reported to be moderate.

We have now described how we operationally will measure our primary research question (p. 5, line 12): *It is anticipated that EDR and sleep problems will be at least moderately associated. This expectation is in alignment with the meta-analytic results of average moderate effect sizes in the relationship between EDR and sleep in non-ADHD samples*^{14 15}.

Comment 3: Page 6 and 8; “iv) whether studies have controlled for use of CNS medications-, and v) whether studies have controlled for comorbid psychiatric disorders in their study design and/statistical analyses”. To me this sounds as a descriptive question that can be answered yes/no. Are the authors not interested in the effect sizes of the associations when these factors are controlled for?

Response:

We are interested in how the control for use of CNS medication and presence of comorbid disorders affect the effect sizes reported. This is now described clearer (p. 5, l. 21): *Therefore, as secondary outcomes, we will consider if the effect sizes reported of the relationship between EDR and sleep are affected by how EDR and sleep are measured, age group included, and further if the effects are affected by how studies have controlled for the use of CNS medication, the presence of comorbid disorders, and/or circadian preference.*

Comment 4: Page 8; Here the authors state that neurotypical controls will be included. What measures from controls will be examined and reported?

Response:

We have now removed this information from the manuscript as it is the relationship between EDR and sleep in samples with ADHD that we will investigate.

Comment 5: Page 9; “Any disagreement will be resolved by an independent “third”

investigator.” Does this refer to initial disagreement or disagreement after discussion between the primary investigators?

Response:

This refer predominantly to disagreement after discussion between the primary investigators. We have added “after a discussion between the two independent investigators” in the sentence (p. 8, l. 21) : Any disagreement *after a discussion between the two independent investigators* will be resolved by an independent third investigator.

Reviewer: 2

Dr. Philippa Fibert, Queen Mary University of London

Comments to the Author:

Comment 1: There is no mention in the Introduction section of previous reviews of the triad of EMD, sleep and ADHD, and what new knowledge will be provided by this review compared to previous reviews. A brief description of other reviews and their findings is needed. This protocol appears similar to a published Masters thesis by one of the authors (Amalie Lykkebø). Please explain how this review builds upon Amalie Lykkebø's previous work, and that of previous reviews, and what novel information it will provide.

Response:

To our knowledge, there are no prior systematic reviews of the relationship between sleep problems and EDR in ADHD. We have searched both for pre-registered reviews, protocols, and papers. If the reviewer is aware of already published or pre-registered reviews on the same topic as our planned systematic review, we would be happy to incorporate such a review in our protocol. We have now referred to two meta-analyses on the relationship between aspects of sleep and EDR in non-ADHD samples published in 2024.

Regarding the master thesis, we have noted in our PROSPERO pre-registration that we conducted pilot work for our systematic review. The master thesis was thus piloting predominantly the search strategy and study identification, and only superficially piloting the synthesis of the studies included. Please note that

PROSPERO do not accept a master-thesis as an independent systematic review study, and this is why we did not refer to the thesis in the original submission. The search strategy included in this protocol has been substantially revised from our pilot searches by extending the search terms and strategy. Further, the synthesis of included studies, as described in this protocol, has also been substantially revised from our pilot synthesis by considering the multifaceted nature of both sleep and emotional dysregulation, and the complexity of studying this relationship in ADHD.

We can see that the pilot work should have been described in the protocol and not just in the pre-registration. We have now included this as part of the methodology for the systematic review and referred to the master thesis as part of this description (p. 6, l. 7): *In the pre-registration, pilot work on this systematic review is noted based on a master thesis in clinical psychology²⁷.*

Comment 2: I do not think we need a detailed description of the 5 secondary research questions in the Introduction section. These are then repeated in less detail under 'Outcomes'. I suggest using the Introduction descriptions in the 'Outcomes' section as they are clearer. In the Introduction, summarise briefly, but better describe the rationale for these secondary research questions.

Response:

Thank your for this suggestion. As suggested, we have moved the secondary research questions to the methods section. We have added the following text in the introduction to make the rational clearer for the secondary research questions (p. 5, l. 16): *The heterogenous nature and sample characteristics of ADHD are also important to consider in the relationship between EDR and sleep in ADHD. The often prescribed CNS medication seems to have a limited effect in improving EDR in ADHD²¹, whereas mixed findings are reported on its effect on sleep ^{22 23}. The high prevalence of comorbid disorders in ADHD^{4 24 25} and circadian preference²⁶ may also affect EDR and sleep.*

Comment 3: Regarding study limitations, I found this phrase in the summary: "limitation is that we will predominantly include peer-reviewed studies." However I could not find it in the text, nor any explanation as to what makes it a limitation.

Response:

We have now added the following text (p. 7, l. 17): *This could pose a limitation by not including relevant work published as pre-prints or grey literature, or publications in other languages.*

Comment 4: I note that this study started in February, therefore any revision to the methodology is inappropriate.

Response:

We apologize for the misunderstanding by setting the starting date in February. The study has not yet started and we welcome constructive feedback on our methodology. We have now changed the starting date to June 2025. However, we will start with the systematic review when this manuscript has been accepted for publication.

Comment 5: The English is mostly fine. However inappropriate use of prepositions and plurals inhibits the flow. I suggest the document is proof read by a native English speaker.

Response:

The revised version of the manuscript has been proof read by a native English speaker.

VERSION 2 - REVIEW

Reviewer	1
Name	Frick, Matilda
Affiliation	Stockholm University
Date	07-May-2025
COI	

The authors have addressed all of my queries in a satisfactory way. I have no more comments to add and wish them luck in conducting this review.

Reviewer	2
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Name	Fibert, Philippa
Affiliation	Queen Mary University of London, Sport, Health and Applied Science
Date	14-May-2025
COI	

Thank you for addressing my comments and acting politely and appropriately on them! I have no further issues and am happy to recommend this protocol for publication.