

BMJ Open Sleep duration and eating behaviours in youth: a scoping review protocol

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ABSTRACT

Introduction Developmental alterations to the circadian rhythm, in combination with lifestyle changes (eg, changes in school start time, part-time employment), contribute to insufficient sleep among youth. Insufficient sleep is associated with poor eating behaviours in other developmental stages (ie, childhood, adulthood); however, it is currently unknown if this finding generalises to youth. Consequently, identifying the characteristics and results of the studies examining this relationship in youth populations is necessary to guide the future direction of research in this field.

Methods and analysis We will conduct a scoping review to investigate the literature examining the relationship between sleep duration and eating behaviours in youth. The proposed scoping review will follow the standard six-stage protocol outlined by Arksey and O'Malley. To acquire relevant publications, systematic searches were conducted in PubMed, CINAHL, PsycINFO and Scopus in August 2019. Following this, a scan of the grey literature will be conducted. All relevant publications will be screened for their eligibility based on the predefined inclusion and exclusion criteria. A data extraction tool will be used to collate, summarise and report the results. The findings of the scoping review will be reviewed by relevant stakeholders to aid in interpreting and disseminating the findings. The proposed review will identify existing gaps in the literature and inform the conduct of future studies aimed at understanding the effects of insufficient/excessive sleep and the eating behaviours of youth.

Ethics and dissemination This scoping review does not require ethics approval. Following the completion of the study, the findings will be disseminated at scientific meetings, submitted for peer-reviewed publication and translated to an accessible format for other relevant stakeholders.

INTRODUCTION

Background

Diet-related diseases are the leading cause of death worldwide.^{1 2} Diets, characterised by excessive saturated fat, sugar and salt, are associated with many chronic diseases, such as type II diabetes, cancer and cardiovascular diseases.^{3–6} In addition, high quality dietary intakes confer mental health benefits, such as improved psychological functioning.^{7–10} As such, healthy eating is an area of high priority in public health.⁴ The eating behaviours of teenage youth are especially important

Strengths and limitations of this study

- The proposed scoping review will be the first synthesis of research in the field of sleep duration and eating behaviours in youth population.
- The proposed scoping review will synthesise data from peer-reviewed publications and grey literature (eg, government reports).
- The findings from this review will identify gaps in the literature, which can be used to guide the future direction of research in the field of sleep and eating behaviours.
- The methodological quality of the articles included in the final review will not be appraised.
- The proposed review will not examine the size of the effects regarding the relationships between sleep duration and eating behaviours.

because many lifestyle habits that have immediate and long-term health consequences (eg, eating behaviours, physical activity, sedentary behaviours) emerge during adolescence.^{11–13} In addition, the troublingly high prevalence of disordered eating and obesity among teenagers necessitates examining the lifestyle characteristics that can be leveraged to support healthy eating behaviours (ie, food choices, eating habits) in youth.^{14–20} One lifestyle factor that has recently received increasing attention in the context of eating behaviours is the sleep duration.

The United Nation defines 'youth' as persons between the ages of 15 and 24 years old.¹⁰ The current study will focus on the United Nation's definition of teenage youth, who are individuals between the ages of 13 and 19 years old.²¹ This period of transition from childhood to adulthood is considered an important period of development (physical, cognitive, psychological) and formation of healthy habits.^{22 23} Additionally, changes to the circadian rhythm occurring during this developmental period result in a natural shift towards a later-sleep onset among youth.²⁴ This shift can contribute to insufficient sleep, which is further compromised by changes such as early school start times, increased



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academic demands, extracurricular activities and part-time employment.^{25–27}

Insufficient sleep, often operationalised as <6.5–9 hours of sleep at night,²⁸ has been linked to poor eating behaviours in children²⁸ and adults.²⁹ In a review by Felsö *et al*,²⁸ the researchers concluded that restricted sleep is associated with many unhealthy dietary habits in children, such as higher consumption of energy-dense food, sugar-sweetened beverages and high caloric intake. Comparable results are emerging in studies investigating the youth.^{30–34} However, the body of research in this field is substantially smaller. Due to the changes in the sleep pattern that occur during the teenage years, it is important to determine whether the findings from children and adult populations can be generalised to youth. Therefore, clarifying the association between sleep duration and eating behaviours in youth is necessary, as it may help researchers and clinicians better understand the complex relationships between sleep, obesity, disordered eating and chronic health issues.²⁹

Rationale

Research on sleep duration and eating behaviours in youth is still in its infancy. As a modifiable risk factor for several chronic health conditions (eg, obesity) and mental health problems (eg, disordered eating), sleep duration can be targeted with interventions not only to improve the quality of life, but also support optimal nutrition for healthy development and to prevent chronic diseases in adulthood. The developmental changes experienced by youth may lead to changes in eating behaviours that are unique to this developmental period. Investigating the association between sleep duration and eating behaviours can aid clinicians working with youth with chronic health conditions and mental health problems, such as obesity and/or disordered eating, to better understand how sleep duration influences treatment adherence to nutrition therapy or desired health outcomes. Furthermore, the findings of the proposed review will foster the development of new research to elucidate the mechanisms linking sleep and eating behaviours. To our knowledge, there has been no published review of the literature addressing youth sleep duration and eating behaviours.

Research questions

The objective of this scoping review is to review the literature on sleep duration and eating behaviours (ie, dietary food selection, food intake, food preferences and eating patterns) in youth. Although both sleep and eating behaviours are associated with certain health conditions, this scoping review will not report on any relationship between these behaviours and health outcomes and will instead focus solely on the relationship between sleep and eating variables. The primary research question of this scoping review is: What is the nature of the research on the relationship between sleep duration and eating behaviours (ie, food choices and eating habits) in youth? The secondary questions are: (1) Which research designs

have been employed? (2) Which youth populations have been studied? (3) Which outcome variables have been assessed? and (4) What questions remain to be addressed? The information acquired and synthesised in the scoping review will help advance the field of sleep and eating behaviour among youth by presenting recommendations for future areas of research.

METHODS AND ANALYSIS

Study design

Scoping reviews are an increasingly popular method to systematically map the literature on a topic of interest. We will use a scoping review to map out the literature on sleep duration and eating behaviours in youth. Our scoping review protocol will use the framework provided by Arksey and O'Malley (2005).³⁵ The stages are: (1) developing a research question; (2) identifying the relevant studies; (3) selecting the studies; (4) charting the data; and (5) collating, summarising and reporting the results and (6) the optional stage of stakeholder consultation.³⁵ A scoping review was selected to identify the study characteristics, findings and gaps in this growing body of literature because there are currently no published reviews on this topic. Additionally, the findings from this scoping review can inform whether it would be appropriate to conduct other types of reviews, including narrative, systematic or meta-analytic reviews. However, a common limitation of a scoping review is that it can generate very extensive data which can make data synthesis difficult.³⁵ Therefore, we have limited the breadth of the research questions to enhance the ability of our scoping review to provide a detailed synthesis of youth sleep duration and eating behaviours. This protocol is reported according to the instructions of an adaptation of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol checklist (PRISMA-P; online supplementary file A).³⁶ We have adapted the PRISMA-P checklist to omit discussion of items not relevant to scoping reviews, including: (1) risk of bias in individual studies, (2) meta-bias and (3) confidence in cumulative evidence. The final report of the review will conform to the PRISMA for Scoping Reviews (PRISMA-ScR) guidelines.³⁷

Eligibility criteria

Types of participants/population

The population of interest for this scoping review includes youth in their teenage years (aged 13–19 years old).²¹ This scoping review will include all teenage populations, healthy and/or those with health issues.

Types of study designs

This scoping review will select all published primary studies that use any study design (eg, randomised trial, cohort, case control, longitudinal, cross-sectional, qualitative and so on). As such, reviews and commentaries will be excluded.

Types of variables

To be included in the review, the study must explicitly refer to sleep duration (eg, sleep duration, sleep restriction/insufficient sleep/deprived sleep/decreased sleep) and eating behaviours (eg, food choices and/or eating habits) in youth. Primary research that reports on any length of sleep duration (short or long) will be included in the final review. Prior to the screening process, eating behaviours will be operationally defined as a reference to at least one of the following topics: quantity of food intake, food preference, food selection, meal timing or eating patterns.

Language

Only publications in English will be included in this scoping review.

Exclusion criteria

Studies selected must not specifically examine infants (0–1 year old), toddlers (1–3 years old), pre-schoolers (3–5 years old), school-aged children (6–12 years old), adults (20–65 years old) or seniors (65+ years old).

Information sources/Search strategy

To identify relevant studies, a systematic search will be employed in the following electronic databases: (1) PubMed; (2) CINAHL; (3) PsycINFO and (4) Scopus. The search strategy (online supplementary file B) was developed in consultation with two subject-specialty liaison librarians and produces a feasible number of studies to review. For instance, this search in the PubMed database yields 389 results. The systematic searches were conducted in August 2019. To complement the electronic search, we will also hand-select articles that meet the criteria from the reference lists of relevant publications. We will also conduct a scan of the grey literature according to the recommendations of Godin *et al.*³⁸ While searching the grey literature, first, the websites of organisations and agencies relevant to youth sleep and nutrition will be examined. To identify the relevant organisations, we will primarily use Google searches and recommendations from the research team. After identifying relevant organisations and agencies, we will contact the organisation. We will describe our study to the organisation and investigate whether they have relevant information to contribute to the scoping review. Following this, we will scan two search engines: the (1) Canadian Public Health Information (Ontario Public Health Libraries Association) and (2) Canadian and international government publications (maps, data, and government information centres). All relevant publications will be uploaded to a citation management system, where duplicates will be removed prior to advancing to the study selection stage. Our selected management system will also permit us to document the decision made during the screening process.

Study selection

Once we have uploaded the publications retrieved using our search strategy, this review will follow a two-level

screening process to determine whether the published articles meet the inclusion criteria for the scoping review. At each screening level, there will be at least two data reviewers who will independently screen all relevant publications identified. The number of publications that are deemed to meet the inclusion or exclusion criteria will be recorded. The first stage of this two-level screening process will require the data reviewers to assess the eligibility of the relevant articles using the title and the abstract. Any publication where (1) both reviewers unanimously agree to include or (2) do not unanimously agree to include, will proceed to the second level of the review process to be read in full to determine eligibility. The remaining publications that both reviewers unanimously agree to exclude will not proceed to the second level of the review process.

The second level of the review process will require both reviewers to read in full all the articles that passed the first level of the review process. In cases where the reviewers disagree on the eligibility of the article, they will meet to discuss the article together. If the two reviewers are unable to reach a consensus on the eligibility of the article, a third reviewer will be consulted to provide inputs for the final decision. To document the level of agreement between the raters, at each level of the screening process, the inter-rater validity will be assessed for the selection strategy using kappa. In addition, the reviewers will be trained by the first author to ensure consistency among all reviewers. All reviewers will first practice screening an identical set of citations. Once consistency has been established, the reviewers will proceed to screen the citations independently. The authors will document the results of the study selection process following a standardised PRISMA flow chart.³⁹

Data extraction

Publications that meet the full criteria for inclusion will have their data extracted and charted. The characteristics of each study (eg, population type and study design) will be extracted by two independent reviewers and reported using a tool developed by Romano *et al.* (online supplementary file C).⁴⁰ In addition, we will consult a qualitative researcher to assist us in adapting the tool to make it ideal for extracting qualitative data. The extracted characteristics will be charted following the two-step suggestions of Daudt *et al.*⁴¹ The first step is to select a number of studies that will undergo data extraction by the research team collectively; following this, the reviewers will independently extract the data from the studies assigned to them. Any uncertainty about which data should be extracted will be discussed between the reviewers. If they are unable to reach a consensus, an additional reviewer will be consulted until a final decision is reached. Engaging in this two-step procedure will help establish consistency in the data extraction procedure among the research team prior to proceeding to extract and chart the data independently.

Data analysis and synthesis

We will collate, summarise and report all data collected from the data extraction stage. The primary purpose of the data synthesis and analysis stage will be to map the extensive data collected from all the studies referring to sleep duration and eating behaviours in youth. The summaries will be categorised into two broad themes: food choices and eating habits. The section on food choices will discuss the quantity of food consumed for a given food category (eg, vegetable and fruit, high fat/sugar/salt foods and sweetened beverages) whereas the section on food habits will discuss the contextual factors under which eating occurred (eg, distracted eating, meal timing and sense of overeating). Within each category, there will be subcategories according to study design (eg, randomised trial, case control, cross-sectional, qualitative etc). To analyse the data, descriptive analyses (eg, frequency analyses) and thematic analysis will be used to assess quantitative and qualitative studies, respectively. To conduct a thematic analysis, we will follow the six-step framework outlined by Braun and Clarke (2006).⁴² The findings will be summarised and presented using tables, charts and visual maps. Included in the synthesis will be a discussion of potential confounding and effect-modifying variables that may be implicated in the relationship between sleep duration and eating behaviours in youth. Importantly, the results of the scoping review will be reported in an aggregate, rather than discrete, manner to facilitate an understanding of the overall nature of the research conducted for assessing sleep duration and eating behaviours in youth. The results will be aggregated by calculating the mean estimate across studies. The final results of the scoping review will allow us to identify the gaps in the literature and provide recommendations for future research. The proposed scoping review will be reported according to (PRISMA-ScR).³⁷

Stakeholder consultation

During the process of conducting grey literature search, we will identify potentially relevant organisations and agencies to be contacted. We will reach out to relevant organisations to inquire whether there is an individual within the organisation who would be interested in reviewing the findings. Once key stakeholders are identified, meetings will be held to discuss the findings and dissemination plan.

Patient and public involvement

Neither patients or the public was involved in preparing this protocol or will be involved in the final scoping review.

ETHICS AND DISSEMINATION

Once all stages of the scoping review have been completed, the findings will be submitted for presentation at relevant scientific meetings (eg, Canadian Public Health Association, Obesity Canada, World Sleep Society) and in peer-reviewed publications. We will use an integrated

knowledge translation approach to involve relevant stakeholders in generating research outputs (eg, fact sheets, infographics) that are suitable for multiple communities of practice, including clinicians and policymakers, as well as for youth and their families. Our goal is to help inform research for future directions on sleep and eating behaviours.

Ethics approval is not required for this review, as all data will be acquired from peer-reviewed publications and grey literature.

This proposed review will map out the literature reporting sleep duration and eating behaviour in youth. The findings will provide an overview of the current state of the literature on sleep and eating behaviours in youth, identify the gaps in the knowledge base and inform future research directions in the field. We envision this scoping review will help in improving the health and well-being of youth.

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Contributors Both authors meaningfully contributed to preparing this scoping review protocol. Specifically, ND conceived the idea, developed the research questions, systematic search strategy, data analytic plan, data extraction tool and drafted the scoping review protocol. MAF contributed to revising the methodology, editing the drafts and providing meaningful feedback on the overall protocol. Both authors agree to be accountable for all aspects of the submitted scoping review protocol.

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