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Exploring Sleep Hygiene Practices during The Covid-19 Pandemic in Children and Adolescents : A Scoping Review

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ABSTRACT

Background *: Amidst the Covid-19 Pandemic, school closures and social distancing measures have introduced challenges that may contribute to sleep issues in children and adolescents. Delving into the exploration of sleep hygiene practices becomes crucial for a comprehensive understanding of these practices during this unique period.*

Purpose *: This scoping review aims to comprehensively synthesize existing literature on how the Covid-19 pandemic has influenced the sleep behavior, encompassing aspects like physical activity, screen time, and substance use among children and adolescents aged 5-19 years.*

Methods *: The extensive literature searches across five databases (Ebsco, Pubmed, Science Direct, Scopus, and Google Scholar). Out of the 1278 references initially identified, a meticulous screening process led to the inclusion of 41 eligible studies for thorough analysis.*

Results *: Among the 41 studies analyzed, 29 focused on physical activity, 14 explored screen time, and 10 delved into substance use. Notably, a majority of participants exhibited a reduction in sleep duration during lockdown. Physical activity was primarily impacted by a decrease in its duration, and recommended interventions for increasing physical activity included home-based, online-based, and mixed interventions. The majority of participants experienced an increase in screen time, engaging in academic and leisure activities. Interestingly, substance use behaviors declined amidst the pandemic situation.*

Conclusion *: Sleep hygiene behaviors have undergone notable changes during the pandemic, particularly in terms of reduced physical activity and increased screen time. On a positive note, there has been a reported decline in substance use behaviors. The pivotal role of parents emerges as crucial in fostering positive behaviors among children and adolescents during these challenging times.*

KEYWORDS
Adolescent, children, physical activity, sleep hygiene, screen time, substance use

INTRODUCTION

The World Health Organization (WHO) declared a global 22 pandemic caused by the coronavirus (COVID-19) on March 11, 2020. Many countries around the world have imposed a period of 'lockdown' through public health legislation, which included the closure of non-essential businesses, social distancing, travel restrictions, and restrictions on social gatherings (WHO, 2020). Infectious disease outbreaks, when combined with control measures, are associated with significant psychologic distress and symptoms, including poor sleep quality (Wu K, 2020). Previous research has shown that school closures and separation from friends can lead to sleep issues in children and adolescents (O'Kane et al., 2021). Four point seven percent reported fewer sleeping hours during lockdown, and 64% of students experienced sleeping difficulties (Akulwar-Tajane et al., 2020).

Good habits are necessary for good health; developing long-term and beneficial routines makes healthy behaviors feel almost automatic (Kor and Mullan, 2011). Good sleep hygiene (behaviors that ensure adequate and high-quality sleep) can benefit both physical and mental health (Jenkinson et al., 2020). Promote the sleep hygiene behavior such as regular daytime exercise, limiting screen use and intake of caffeine, nicotine and alcohol before for

optimal sleep. Changes caused by Covid-19, such as self-isolation, may have resulted in increased sedentary behavior, alcohol consumption and screen time, all of which have the potential to disrupt sleep directly (Jenkinson et al., 2020).

Given the scope and severity of global lockdown measures, there is a need for research into the effects of pandemic-related restrictions on children's and adolescents' sleep hygiene behaviors. This study tried to summarize systematically the available literature investigating the impact of Covid-19 pandemic in the sleep hygiene behavior (physical activity, screen time, and substance use) of children and adolescent (5-19 years).

METHODS

The Joanna Briggs Institute scoping review development guidelines were followed during the conduct of this scoping review (Peters MDJ, 2020), as well as Checklists for Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extensions for Scoping Reviews (PRISMA-ScR) and Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) 2015 (Shamseer et al., 2015).

Inclusion criteria

Participants

The review focused on children and adolescent between ages 5-19 year. Children 0-4 not included in this study because in the preschool children have different bedtime routine (Wilson et al., 2015). If the results were separated by age, studies that included populations both within and outside of the 5- to 19-year age range were included in the full-text review. Studies were included if the age ranges overlapped slightly and the majority of the sample was aged 5 to 19 years.

Concept

All articles that examined the sleep hygiene behaviors (physical activity, screen time activity and substance use)(Jenkinson et al., 2020) in populations 5-19 years of age within context of the COVID-19 pandemic. The physical activity included indoor and outdoor activity, all of the form of screen time activity included to this study. Substance use that include in this study based on the previous study that discuss about sleep hygiene behavior during Covid-19 that are caffeine, nicotine and alcohol (Jenkinson et al., 2020).

Context

Papers must have been published within the period following the World Health Organization's declaration of COVID-19 as a global pandemic to be considered for inclusion in this scoping review. All papers published after March 11, 2020 were included in this study. There were no restrictions on the included studies in terms of country or geographic location.

Type of sources

Due to the real-time, evolving nature of the COVID-19 pandemic and the need for timely dissemination of evidence, this scoping review included all primary research studies and study designs, secondary data analyses, other systematic and scoping reviews, commentaries, editorials, and gray literature.

Search strategy

The search was conducted on December 21, 2021 and limited to papers published March 11, 2020, or later with the search term “sleep hygiene”, “physical activity”, “screen time”, “substance use”, “smoking”, “alcohol”, “nicotine”, “caffeine”.

Information sources

Four databases (PubMed, Science Direct, Ebsco and Scopus) and searches for gray literature and unpublished papers were conducted manually through Google Scholar and Google custom search.

Study selection

Uploaded identified references into EndNote X9 and removed duplicates. Screened the titles and abstracts and assessed the full texts in detail against the inclusion criteria.

Data extraction

The extraction form included all relevant details including the following: identification information (title, first author, date, country, and journal); participants (total number [male/female]), age range (mean); population description; methods (objective, article type, study design).

Data charting and presentation

To describe the characteristics of the included studies, such as the number, geographic distribution, populations, and study designs, a basic numeric analysis was performed. Following that, a content analysis was performed to present the findings of the included studies thematically based on outcomes.

RESULT

A total of 1278 articles were retrieved, with 47 removed due to duplication and another 1062 excluded due to irrelevance either through title and abstract screening. The remaining 53 articles were full-text reviewed, with 12 articles being excluded. This scoping review included the remaining 41 articles.

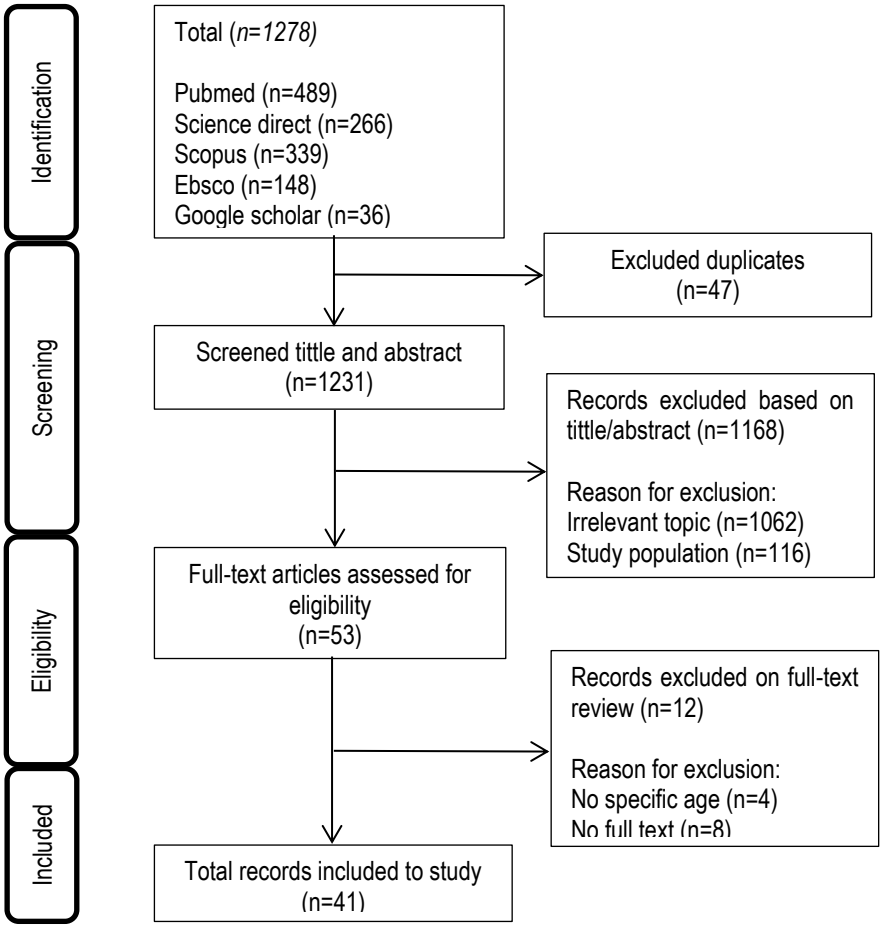

Figure 1. Flow chart of stages of article selection

This review included all of the study designs and all of the article types. The final list, from 41 including studies 33 original articles, 5 editorial/commentary and 3 reviews (table 1). A total of 27 countries were represented in the studies, with multi-country (n=5), Brazil (n=2), China (n=2) composing the majority; a complete breakdown is presented in table 1 and 2.

Table 1. Characteristics of article type, study design, and country of included studies

Classification	Number	Percentage (%)
Article type (*n*=41)		
Original research	33	80.5
Editorial/commentary	5	12.2
Review	3	7.3
Study design (*n*=33)		
Cross-sectional	24	72.7
Longitudinal	5	15.2
Mixed methods	2	6.1
Qualitative study	1	3
Intervention	1	3
Country and region (*n*=33)		
Multi-country	5	15.2
Brazil	2	6.1
China	2	6.1
India	1	3
Jordania	1	3
Saudi Arabia	1	3
Indonesia	1	3
Greece	1	3
Australia	1	3
Poland	1	3
Northern California	1	3
UK	1	3
Israel	1	3
Italy	1	3
Czech	1	3
Qazvin	1	3
France	1	3
Austria	1	3
Iran	1	3
South Korea	1	3
Poland	1	3
Greece	1	3
Findland	1	3
Ireland	1	3
USA	1	3
Catalonia	1	3
Latin America	1	3

Table 2. Characteristics of included studies

No	First author, Year	Article type	Study design	Population	Age (Mean±SD or range) (years)	N	Country	Topic of study
1	(Abouzid et al., 2021)	Original research	Cross-sectional	Youth	8 to 19	6019	MENA region	Physical activity, screen time
2	(Ainsworth and Li, 2020)	Editorial/ commentary	NA	NA	NA	NA	NA	Physical activity
3	(Akulwar-Tajane et al., 2020)	Original research	Cross-sectional	Undergraduate student	20.15 ± 1.46	150	India	Physical activity, screen time
4	(Al Hourani et al., 2021)	Original research	Cross-sectional	Children and Adolescent	6 to 17	477	Jordania	Physical activity
5	(Alghadir et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 18	214	Saudi Arabia	Physical activity, screen time
6	(Andriyani et al., 2021)	Original research	Qualitative study	Adolescent	12 to 15	20	Indonesia	Physical activity, screen time
7	(Androutsos et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 18	397	Greece	Physical activity
8	(Armatas, 2020)	Editorial/ commentary	NA	NA	NA	NA	NA	Smoking
9	(Arundell et al., 2021)	Original research	Cross-sectional	Children and Adolescent	5 to 18	218	Australia	Screen time
10	(Astley et al., 2021)	Original research	mixed methods	Adolescent	10 to 19	27	Brazil	Physical activity
11	(Bandara et al., 2020)	Editorial/ commentary	NA	NA	NA	NA	NA	Smoking
12	(Besaratinia and Tommasi, 2021)	Review	NA	NA	NA	NA	NA	Smoking
13	(Bingham et al., 2021)	Original research	Cohort	Children and Adolescent	9 to 13	949	Bradford, UK	Physical activity
14	(Bronikowska et al., 2021)	Original research	Cross-sectional	Adolescent	15.4	127	Poland	Physical activity
15	(Chaffee et al., 2021)	Original research	Prospective cohort study	High school student	Grade 9 and 10	1423	Northern California	Physical activity, substance use

No	First author, Year	Article type	Study design	Population	Age (Mean±SD or range) (years)	N	Country	Topic of study
16	(Chen et al., 2020)	Review	NA	NA	NA	NA	NA	Physical activity
17	(Clare et al., 2021)	Original research	Cohort	Adolescent	12	443	Tasmania, western Australia, New south wales	Alcohol consumption
18	(Cocca et al., 2021)	Original research	Cross-sectional	Adolescent	12.42	26	UK	Physical activity
19	(Constantini et al., 2021)	Original research	Cross-sectional	Adolescent	16–18	473	Israel	Physical activity
20	(Cosenza et al., 2020)	Original research	Cross-sectional	Adolescent	13-19	364	Italy	Alcohol consumption
21	(Cosma et al., 2021)	Original research	Cross-sectional	Adolescent	11 to 15	144	Czech	Screen time
22	(Cowley et al., 2021)	Original research	Intervention	Adolescent	13 to 16	42	UK and Ireland	Physical activity
23	(Fazeli et al., 2020)	Original research	Cross-sectional	Adolescent	13 to 18	1512	Qazvin	Screen time
24	(Fillon, 2021)	Original research	cohort	Children and Adolescent	5 to 17	NA	France	Physical activity
25	(Geets Kesic, 2021)	Original research	cohort	Adolescent	14 to 18	859	Bosnia and Herzegovina	physical activity
26	(Guo, 2021)	Original research	Cross-sectional	Children and Adolescent	7 to 15	10,416	Austria	physical activity, screen time
27	(Gupta and Kalagher, 2021)	Review	NA	NA	NA	NA	NA	Smoking
28	(Hadianfard et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 16	510	Iran	Physical activity, screen time
29	(Kim et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 18	105,600	South Korea	Physical activity
30	(Kołota and Głąbska, 2021)	Original research	Cross-sectional	Adolescent	10 to 16	1334	Poland	Screen time
31	(Lu et al., 2020)	Original research	Cross-sectional	Adolescent	15.26	965	China	Physical activity
32	(Malta et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 15	9,470	Brazil	Physical activity, screen time, alcohol consumption
33	(Margaritis et al., 2020)	Editorial/ commentary	NA	NA	NA	NA	NA	Physical activity, screen time
34	(Mittal et al., 2020)	Editorial/ commentary	NA	NA	NA	NA	NA	Physical activity
35	(Morres et al., 2021)	Original research	Cross-sectional	Adolescent	12 to 17	518	Greece	Physical activity
36	(Ng et al., 2021)	Original research	Cross-sectional	Adolescent	7 to 19	2408	Findland	Physical activity
37	(O'Kane et al., 2021)	Original research	mixed methods	Adolescent	12 to 14	281	Ireland	Physical activity, screen time
38	(Pelham et al., 2021)	Original research	Cross-sectional	Adolescent	9 to 10	7,842	US	Substance use
39	(Rogés et al., 2021)	Original research	Cross-sectional	Adolescent	14 to 18	303	Catalonia	Substance use
40	(Ruíz-Roso et al., 2020)	Original research	Cross-sectional	Adolescent	16 to 19	726	Latin America	Physical activity
41	(Xiao et al., 2021)	Original research	Cross-sectional	Adolescent	Grade 7-12	1,680	China	Physical activity, screen time

Sleep in Children and adolescent during Covid-19

The results of this study for sleep in children and adolescent during Covid-19 get 3 themes were sleep hour, sleep quality and insomnia. The recommendation of sleep hour from National Sleep Foundation for school-age is 9-11 hours and for adolescent is 8-10 hours (Hirshkowitz et al., 2015).

During lockdown, respondent more tended to sleep longer than 10h/night, and fewer slept less than 8h/night before the lockdown (Androutsos et al., 2021). One of the study said that during that time children and adolescent spending the average time of sleep around 10.6 hours/night (Bingham et al., 2021). But one study found that during Covid-19 pandemic, the sleep hour for children and adolescent was decreased, in the lockdown period 4.7% respondents reported decreased of sleep hours (Akulwar-Tajane et al., 2020). The other sleep variable that found was sleep quality, during pandemic Covid-19 sleep quality was similar before and during lockdown (O'Kane et al., 2021). Insomnia also reported during this time, for about 34.9% participants get insomnia (Lu et al., 2020).

Physical activity

A total of 29 studies examined physical activity during the pandemic, 25 articles of original research, 3 articles of editorial/commentary and 1 article of review. There were three themes that we found form the systematically research that were physical activity during covid-19 pandemic, reason burden of physical activity, and intervention/recommendation for increasing physical activity during pandemic Covid-19.

Physical activity during Covid-19 Pandemic

We get 3 themes about the impact of pandemic Covid-19 to the physical activity of children and adolescent that were duration of doing the physical activity, frequency and the physical activity score. During that time, most of the studies found that the duration of physical activity was decreased. More than 50% respondent did not meet the PA hour recommendation or had less than 1hour (Al Hourani et al., 2021). The average of moderate and vigorous PA (MVPA) during restriction was 72.52 min/day and 89.32 min/day after restriction (Cocca et al., 2021), and more less average hour from the other study that said the mean of MVPA 3.62h/week and vigorous PA (VPA) was 2h/week (Cowley, et al., 2021). For 41.4% of total students reported “16–30 min/ day” for light activity and 53.6% and 53.7% of students reported only “0–15 min/day” for moderate and vigorous activities (Guo, 2021).

The frequency of physical activity also decreased, of the 66% respondents had decreased of PA (Androutsos et al., 2021). The study that comparing the frequency before and during pandemic Covid-19 found that frequencies of VPA and MPA were lower in the 2020 group than in the 2019 group, and the different was significant (Kim et al., 2021). The practice of PA, the prevalence before the pandemic was 28.7% and during the pandemic, 15.74% (Malta et al., 2021).

Most of the studies found that for children and adolescent during pandemic Covid-19 were not meet the PA score recommendation, of the 49.9% of participants were categorized to low PA (Lu et al., 2020). For MPA and VPA combined were below the 50% of the recommended by WHO PA (Morres et al., 2021). One of the studies said there were no differences between before and during lockdown that respondent did not meet the PA score recommendation (O'Kane et al., 2021).

Reason burden of physical activity during pandemic covid-19

We found three reason for the burden of the physical activity in children and adolescent during pandemic Covid-19 that were facility, parental role and school vacation time. The limited facility of physical activity also being one of the reasons for the

burdensome of physical activity, children and adolescent can have the facility in their school but during the restriction and also they restricted for going to school so they cannot have the physical activity like before (Andriyani et al., 2021). The other factor that lead the physical inactivity was parental role, parental stress and disturbances of family interactions, parental modeling, and parenting feeding practices at home (Androutsos et al., 2021). During Covid-19 pandemic and also the same time with the school vacation time, children and adolescent experience low physical activity whether in winter or summer vacation (Al Hourani et al., 2021).

Intervention/recommendation for increasing physical activity during pandemic covid-19

There were 3 types of intervention and recommendation for increasing physical activity in children and adolescent during pandemic covid-19 that were home-based intervention, online-based intervention and mixed intervention. Home-based physical activity (18 PA sessions during the six-week intervention) (Cowley et al., 2021). Home-based exercise program increasing mental health, HRQL, and quality of sleep (Astley et al., 2021). Another intervention is online-based intervention, online sport program group have significant higher of physical activity (Constantini et al., 2021). Exercise activities via live video conference calls (eg, Zoom, Skype) in which teachers or trainers could lead group activities (Mittal et al., 2020). Mixed intervention for example parent and teacher role for physical activity program (Chen et al., 2020). Administrators, physical education teachers, and parents when reintroducing children and youth to PA following a prolonged COVID-19 quarantine period (Ainsworth and Li, 2020).

Screen time behavior

Total of 14 studies examined screen time during the pandemic, 13 articles of original research and 1 article of editorial/commentary.

Screen time behavior during Covid-19 Pandemic

We found from most of the studies said that the respondent had excessive of screen time behavior during pandemic Covid-19. The recommendation of screen time is no more than two hours of sedentary recreational screen time per day for children and young people (Carson et al., 2016). During lockdown, 70% of the adolescents reported spending more than 3 h in front of the screen (Al Hourani et al., 2021). Of 3.3% of student participants spent more than 6 hours on digital devices (Akulwar-Tajane et al., 2020). During lockdown, 44.6% of total students reported over 5 h of screen time on online study each day (Guo, 2021). During weekends, 93% of these children exceed 2 hours of screen time per day, 50% reach at least 6 hours, and 10% reach more than 11 hours (Fillon, 2021).

There were many purposes that we found from the study most of the purposes was for doing schoolwork (Bingham et al., 2021, Xiao et al., 2021, Cosma et al., 2021), for the leisure activities were online gaming (Fazeli et al., 2020), playing video games (Bingham et al., 2021), watching television (Kołota and Głąbska, 2021), and also have social purposes for social communication with family and friend (Arundell et al., 2021). Children reported spending ≥3 h a day doing schoolwork (32.9%) and more than ≥3 h a day playing video games (29.6%) (Bingham et al., 2021). Male students spent 5.2 h on online study and 2.38 h on other ST, female students

spent 5.29 h on online study and 2.56 h on other ST (Xiao et al., 2021). The boys less time in schoolwork (2.6 h) and more time in leisure activities (5.2 h) than the girls (2.9 h for schoolwork and 4.9 for leisure activities (Cosma et al., 2021). Respondent spent 68.12 min/day (SD = 39.83) gaming online during weekends (Fazeli et al., 2020). Most of the student watching television more than 2 h a day was higher than before the COVID-19 pandemic (88.4% vs. 78.3%) (Kołota and Głąbska, 2021).

Screen time behavior and sleep during pandemic covid-19

Screen time behavior also have an effect to the sleep during pandemic Covid-19, in this study we found 2 effects from screen time behavior to sleep. The first effect was reduce the total sleep, a longer duration of digital media use was associated with reduced total sleep time and later bedtime, while greater diversity of digital media use was associated with increased total sleep time and earlier bedtime (Akulwar-Tajane et al., 2020). Second, the behavior of sleep also effected by the screen time behavior, of the 29.3% mentioned that they switch off or use their devices in flight mode during night; whereas 66% use it within the hour they go to sleep and an additional 20.7% compromise their sleep to use their electronic devices (Akulwar-Tajane et al., 2020).

Intervention / recommendation for better screen time behavior during pandemic Covid-19

There were 2 types of intervention and recommendation to improving the better screen time behavior in children and adolescent during pandemic Covid-19 that were including the parent's role (Arundell et al., 2021, Fazeli et al., 2020) and doing the scheduling of the screen time limitation (Akulwar-Tajane et al., 2020). Family support can be the strategy to manage the screen time in children and adolescent (Arundell et al., 2021). Parents need to pay special attention to how much time and how frequently their children play videogames in general, as well as the pandemic period more specifically (Fazeli et al., 2020). The scheduling of the screen time consist of encouraging better bedtime routines, and limiting the device use for academic purposes with alternative sources and strategies (Akulwar-Tajane et al., 2020).

Substance use behavior

A total of 10 studies examined substance use during the pandemic: 6 articles of original research, 2 articles of review and 2 articles of editorial/commentary.

Substance use behavior during covid-19 pandemic

In the Covid-19 pandemic era, we found most of the studies said that there were decline number of substances use behavior in children and adolescent (Bandara et al., 2020, Malta et al., 2021, Pelham et al., 2021); but one of the study said that increase for nicotine use (Pelham et al., 2021). We found three types of substance that were e-cigarette/tobacco (Bandara et al., 2020, Pelham et al., 2021), alcohol (Malta et al., 2021, Pelham et al., 2021, Clare et al., 2021)and cannabis (Rogés et al., 2021). For smoking, daily smoking decreased from 8.9% to 6.3% (Rogés et al., 2021). Declines in current e-cig use among U.S. high school- and middle school students as 19.6% of high schoolers (3.02 million) and 4.7% of middle schoolers (550,000) reported current e-cig use in 2020 (Bandara et al., 2020). The past-30-day prevalence increased for use of nicotine (0% to 1.5%; 0.005)

(Pelham et al., 2021). For alcohol use, most of the studies said that decline the number, dropped to 5.6% post lockdown (Rogés et al., 2021); the consumption of alcohol decreased to 12.77% during the pandemic (Malta et al., 2021). The past30-day prevalence of alcohol use decreased from 1.9% to 0.7% (p ¼ .03) (Pelham et al., 2021). Overall consumption (frequency × quantity) during the restrictions declined by 17% (Clare et al., 2021). The consumption of cannabis decreased from 4.6% to 2.3% (Rogés et al., 2021).

Reasons of declining of substance use during Covid-19 pandemic

There were several reasons for the declining the substance use behavior, the most common reason related to the restriction regulation so they have fewer opportunities to be with people/go out to drink (Clare et al., 2021). Other reasons that may being a reason for declining the substance use behavior were didn't feel like using alcohol, because of work/study commitments, less money to spend on alcohol or saving money and worried effects of alcohol may make symptoms worse if get COVID-19 (Clare et al., 2021).

DISCUSSION

This scoping review showed that the literature of sleep hygiene behavior during pandemic Covid-19 in children and adolescent is varied, many things of behavior that different from their habit before the pandemic. We identified changes in sleep behavior in children and adolescents during pandemic Covid-19 as a result of the lockdown situation and their inability to attend school and see their friends. Our review revealed the types of sleep hygiene behavior and changes in the pandemic Covid-19 situation, as well as the feasibility of interventions aimed at promoting sleep hygiene behavior in children and adolescents.

Sleep is important for children and adolescent, and often need more sleep than adult (Huber and Born, 2014), sleep important for emotional regulation, cognition/academic achievement, quality of life/well-being (Chaput et al., 2016, Jenkinson et al., 2020). We found that during lockdown respondent sleep longer than before, but sleep quality was no different. Pandemic situation also makes fear and have negative effect (Lu et al., 2020). In the stressful life-threatening event such as the COVID-19 pandemic can related to sleep problem and given high prevalence of insomnia (Lu et al., 2020, Dsouza et al., 2020).

Physical activity has some advantages, particularly during the Covid-19 situation. Regular physical activity and exercise promote cardiorespiratory fitness and longevity; for healthy individuals, it is beneficial to be physically active and exercise while socially isolated (Woods et al., 2020). During the pandemic, physical inactivity was linked to poor mental health (Lu et al., 2020) and insomnia (Werneck et al., 2018). In this study we found that for duration, frequency and score of physical activity were decrease and not meet the PA score recommendation. Several reasons for the decreasing of physical activity during Covid-19 Pandemic were facility, parental role and school vacation time. Another study said that because of the public health recommendations to prevent Covid-19 spread (e.g., stay-at-home orders, closures of some exercise's facility such as park, gymnasium) have the potential to reduce daily physical activity (PA) (Woods et al., 2020). The intervention for increasing the physical activity that can be implied such as home-based intervention, online-based intervention and mixed intervention. In the current

COVID-19 pandemic, adolescents face self-isolation and home confinement, as well as school closures and sports facilities, so the adolescent can only engage in physical activity at home (Cowley et al., 2021). In addition, online-based intervention not only can maintain the physical activity but also helped them cope well during the pandemic lockdown (Constantini et al., 2021).

We also found there were increasing of screen time behavior during pandemic Covid-19 in children and adolescent, the duration of screen time was more than the recommendation of screen time (Carson et al., 2016). For students, the reason for engaging in screen time activity was to further their education, continue study work, and stay in touch with friends and family when they were unable to leave their homes, which can have an impact on sleep (Akulwar-Tajane et al., 2020). Many other reasons for excessive screen time were discovered in this study, not only for educational purposes but also for leisure purposes, in the pandemic Covid-19 for children and adolescent the purpose for keeping contact with their friends. Finding from this study, the intervention that can be used to increasing the good screen time behavior were increasing the parent's role (Arundell et al., 2021, Fazeli et al., 2020) and doing the scheduling of the screen time limitation (Akulwar-Tajane et al., 2020). In children and adolescent, parent played important role for their behavior, also role to balancing the positive learnings from media with the potential risks to children's behavior (Lauricella et al., 2015). During pandemic Covid-19, most children and adolescent spend their time in the house, so, the parents should pay more attention to their kids, especially in their screen time behavior.

Substance use have bad effect for sleep, smoking at night was found to be significantly associated with more insomnia and shorter sleep duration (Ph et al., 2021), having experienced alcohol have consequences to short sleep duration (Miller et al., 2017). Covid-19 pandemic have a good effect in adolescent especially their behavior for substance use, most of the studies said that the decreasing of substance use (Bandara et al., 2020, Malta et al., 2021, Pelham et al., 2021), both for smoking (Rogés et al., 2021) and alcohol use (Pelham et al., 2021). Previous study found about the factors associated to smoking behavior in adolescent were greater exposure to people smoking in the home, having more friends who smoke (Santano-Mogena et al., 2021); and for alcohol consumption were parental role and peer also related to school and community (Pedroni et al., 2021). Related to restriction during Covid-19 pandemic, the closure of school and restriction for meeting with others (Woods et al., 2020), with this rule adolescent have fewer opportunities to go out (Clare et al., 2021).

RESEARCH LIMITATIONS

There are some limitations of this review. First, this study included all of the type of article, not only the original research but also editorial/commentary and review, the extensive of the article types to get the comprehension result because the new life in the Covid-19 is the new experience for all of the parts of the world. Second, the majority of studies are observational (cross-sectional) that the relationships discovered should not be interpreted as causal. Third, the studies did not include all of the countries, particularly those on the African continent, limiting the generalizability of our findings.

Another limitation, article included for substance use only in adolescent participants. Previous study said that the regular cigarette use among young people started from aged 11 (Santano-Mogena et al., 2021) and first started consuming alcohol at age 13 (Pedroni et al., 2021). In the future study should separating the age group between children and adolescent age.

Despite all those limitations, this finding can be evidence of the effect of Covid-19 pandemic of the sleep and sleep hygiene behavior in children and adolescent, especially for screen time behavior, physical activity and substance use behavior.

CONCLUSION

During the pandemic situation have several impacts to children and adolescent especially to their sleep, because of the behavior that also effect to their sleep. Sleep hygiene behavior during pandemic situation also different than before especially reducing the physical activity and increasing the screen time. Furthermore, one of the good behaviors develop that is for substance use, respondent reported that have decline behavior. However, the role of parents is really important for children and adolescent to increasing their good behavior.

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