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a- **Title:** Socioeconomic position and excessive daytime sleepiness in the world: a systematic review of empirical studies

b- **Running Head:** Socioeconomic position and excessive daytime sleepiness

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f- **Abstract**

Objective: (1) Describe the current literature on the relationship between EDS and SEP and (2) provide recommendations for consideration of SEP in sleep medicine and biomedical research.
Methods*:* Databases Medline/Pubmed, Web of Science, Google scholar and Scopus were screened using PRISMA guidelines and 19 articles were included in the final synthesis.
Results*:* All studies were cross-sectional. Among these studies, 21.05% (n = 4) are focused on children and adolescent and the lasting 88.95% (n = 15) focused on adults and old people. Age ranged between 8 and 17 years old for children/adolescent and ranged from 18 until 102 years old for adults. Main SEP measures presented in these studies were education, income, perceived socioeconomic status and employment. Sample size in these studies varied from N = 90 participants until N = 33865 participants. Overall, a lower educational level, a lower income and full-time employment were associated with EDS. EDS symptoms are prevalent in women, especially those with a low income or no job; and children and adolescents with difficult living conditions or people working part-time reported more sleep disturbances.
Conclusions*:* SEP is already considered as an important determinant for many health outcomes, but if SEP is embedded in experimental design in psychosomatic research, biomedical research and clinical practice as a constant variable regardless of outcome; it will move forward future investigations.

g- **Keywords:** excessive daytime sleepiness; socioeconomic position; sleep; systematic review; sleepiness; health disparities.

1- INTRODUCTION

Sleep is an essential state to restore and revitalize physiological and mental processes, occupying up to a third of a person's lifetime. The prevalence of sleep disturbances has been increasing steadily over the past decades [1-5], alongside the modern societal and technological changes that influence quality and quantity of sleep.

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Alteration in sleep has been linked to a wide range of health issues including cardiovascular or metabolic disorders [6-12], as well as an increase in workplace and occupational health issues due to sleep disturbances such as excessive daytime sleepiness (EDS) [13-15].

Sleepiness is an imperative biological function defined by the likelihood of falling asleep, however, when this tendency is increased and the propensity to sleep becomes compulsive, it is referred to as EDS [16, 17]. This latter is defined variously as daytime somnolence or when wakefulness is difficult to maintain [16, 17]. This burdensome disorder has been widely studied to understand its physiological and neurological substrates; however, few studies have looked into the association between EDS and socioeconomic indicators of social class or socioeconomic position (SEP) [7, 13, 18-22]. It has been previously shown that a lower socioeconomic status, including employment status, educational level or income, is an important stressor and impacts sleep negatively [23]. Despite the known adverse consequences of excessive sleepiness during the day, literature is scarce on the topic. According to the National Sleep Foundation 2000 Omnibus Sleep in America Poll: 43% of adults report that they are so sleepy during the day and that it interferes with their daily activities a few days per month or more [24].

Substantial evidence has shed some light on the graded association of socioeconomic position (SEP) and health problems [8, 18, 25-30]. However, despite the numerous findings linking SEP with health, there is an enormous lack of research conducted on the relationship between SEP and sleep disturbances. Due to the high implication of SEP in health status and the public health issue that sleep disturbances represent [31], a better understanding of this relationship is necessary.

The present systematic review was performed in this purpose. It has as an objective to (1) describe the current literature on the relationship between EDS and SEP and (2) provide recommendations for consideration of SEP in sleep medicine and biomedical research.

2- METHODS

2.1- Literature search

Articles included in this review were identified by screening in PubMed, Web of Science, Google scholar and Scopus. Keywords used for SEP were “socioeconomic”, ‘’socioeconomic position’’, “socioeconomic status”, ‘’social position’’, ‘’social class’’; and keywords used for EDS were “sleep”, ‘’sleep disorders’’,

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‘’sleep disturbances’’, ‘’sleep complaints’’, ‘’sleep duration’’, “sleepiness”, “daytime sleepiness”, “somnolence” and ‘’sleep quality’’. Screening ranged from January 1990 to December 2020.

2.2- Inclusion and exclusion criteria

Cross-sectional, retrospective and longitudinal studies which include individual SEP indicators such as education, income, occupation, employment status as well as perceived SES were considered. Proxy measures of SEP such as composite measure and aggregate measure of SES were also included. Family SEP measures such as parental education and household income were used when studies participants were children or adolescents. Studies were excluded when they: 1) were not original research, 2) were case report/series, reviews or meta-analysis, 3) were not written in English, 4) have full text not accessible and 5) included participants that already presented specific conditions at baseline (for example chronic disease, high mental health medication, pregnant women, etc…).

2.3- Data extraction

Data extracted from included studies were country (where research took place), type of population, sample size, age (mean or range depending on studies), percentage of each gender in the sample, study design, settings, SEP measures, sleep measures, findings and statistical strength of the association SEP-EDS (Odd Ratio, p value and r) (Table 1). SEP was considered the exposure variable and EDS the outcome variable.

3- RESULTS

3.1- Characteristics of studies

Twenty studies [7, 13, 17-23, 27, 28, 32-39, 52] were included and were all cross-sectional except for one longitudinal study (Table 1). Among these studies, 25.00% (n = 5) are focused on children and adolescent [18, 19, 27, 32, 52] and the lasting 75,00% (n = 15) focused on adults and old people [7, 13, 17, 20-23, 28, 33-39, 52]. Among all these studies, 60,0% (n = 12) were performed in North America [ten in USA [7, 17, 20, 21, 27, 28, 32, 33, 36, 52] and two in Canada [18, 38]], 10.00% (n = 2) in Europe [Switzerland and Norway], 10.00% (n = 2) in South America [Brazil and Peru], 10.00% (n = 2) in Oceania [Australia and New Zealand] and 10.00% (n = 2) in Asia [Japan and Iran]. Age ranged between 8 and 18 years old for children/adolescent and ranged from 18 until 102 years old for adults. 11 studies [17, 19-23, 32, 33, 37, 38, 52] among these twenty articles have a majority of girls/women in their sample. Sample size in these studies

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varied from N = 90 ([13] until N = 33865 [36]. SEP measures presented in these studies were education [13, 17-22, 28, 33, 34, 36, 37, 39], income [7, 18, 20, 22, 27, 28, 32, 37, 52], employment [7, 13, 17, 20, 22, 34, 37], perceived/subjective socioeconomic status (SES) [18, 38, 52], and composite index/tool using more than one SEP measures [23, 35].

3.2- Synthesis of results

Education: Lower education was related to worse perceived sleepiness [21]. Having lower education was associated with more daytime sleepiness [20]. Higher educational attainment was associated with less excessive daytime sleepiness [36]. Men with a low educational level were more likely to suffer from poor sleep quality and short sleep duration [34]. One study reported that higher level of maternal education was negatively related to EDS [19] and another one reported that EDS was not associated with educational status [39].

Income: Lower income-to-needs ratio was related to increased sleepiness [27, 52]. Lower income-to-needs ratio was associated with greater daytime sleepiness [32,52]. Lower family income was associated with EDS [22]. Lower income was associated with difficulty falling asleep and no private insurance was associated with sleep latency >30 min and non-restorative sleep [28]. The prevalence of EDS was lower in adults with a higher family income [7].

Employment: Individuals employed full-time had more sleepiness than those employed part-time or not employed [17]. Men with a low occupational position were more likely to suffer from poor sleep quality and short sleep duration [34]. Men with a low occupational position were also more likely to have long sleep latency [34]. Women with a low occupational position were more likely to have long sleep latency, excessive daytime sleepiness and short sleep duration [34]. One study reported that Office workers had lower EDS scores than line workers [13] and another one reported that there is no association between EDS and employment status [7].

Perceived/subjective SES: In children, higher subjective SES predicted less daytime sleepiness in adolescents, higher subjective SES was associated with fewer sleep disturbances [18]. Being in the highest deprivation quintile was a significant independent predictor of EDS, compared to being in the lowest deprivation quintile [23]. Lower household food security was associated with poor sleep quality, short sleep duration and excessive daytime sleepiness [28]. Subjective SES better predicted daytime sleepiness than objective SES [38]. Lower SES was also associated with more excessive daytime sleepiness [35, 52]. One

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study reported that higher SES was associated with less daytime sleepiness [38] and another one reported that there was no association between SES and EDS [37].

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Table 1
Characteristics of included studies investigating the relation between SEP and Sleepiness/excessive daytime sleepiness

Children and adolescents										
Author	**Country**	**Population**	**Sample Size**	**Mean or range age (years)**	**% women**	**Study design**	**SES measures**	**Sleep measures**	**Findings**	**Odd Ratio, p value, r**
Pallesen 2011[19]	Norway	11^{th}-13^{th} grade adolescents from high schools in Hordaland county	1279	N/A	62.4	Cross-sectional	Parental education (primary school, vocational/high school, college/university)	Behaviorally induced insufficient sleep syndrome (excessive daytime sleepiness, short habitual sleep duration and sleeping considerably longer than usual during weekend/vacations)	Higher level of maternal education was negatively related to EDS	*Maternal education – EDS: OR = 0,51 *Urban living - EDS: OR= 1.52 *Grade average – EDS: p< 0,01
Jarrin 2014[18]	Canada	children and adolescents recruited from schools and neighbourhoods in Montreal	239	8-17 (12.6±1.9)	45.6	Cross-sectional	Objective SES: household income (17 categories) and highest parental education (9 categories) Subjective SES: Subjective Social Status Scale-Youth Version (two 10-rung ladders: school and society, youth reported)	Sleep quality (youth-rated, 10-point scale) Daytime sleepiness (youth-rated, Pediatric Daytime Sleepiness Scale) Sleep disturbances (parent-rated, Children's Sleep Habits Questionnaire) Sleep duration (youth- and parent-reported)	In children, higher subjective SES predicted less daytime sleepiness in adolescents, higher subjective SES was associated with fewer sleep disturbances.	Subjective SEP was associated with daytime sleepiness (p <.01)
Bagley 2015[27]	USA	children recruited from semirural public schools in the southeastern US	271	11.33±7.74	47	Cross-sectional	Income-to-needs ratio (computed by dividing family income by the federal poverty threshold for the same family size)	1-week actigraphy (sleep duration, night waking duration, variability in sleep schedule) School Sleep Habits Survey	Lower income-to-needs ratio was related to increased sleepiness.	A lower income-to-needs ratio was moderately related to increased sleepiness (p = 0.01)

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								(Sleep/Wake Problems Scale, Sleepiness Scale)		
Tomaso 2020[32]	USA	adolescents members of a cohort recruited from advertisements in a small city in the Midwest US	184	11-14 (12)	50.5	Cross-sectional	Family income-to-needs ratio (dividing family income by year's federal poverty level for a specific family size)	Sleep wake problems (Sleep–Wake Problems Behavior Scale of the Sleep Habits Survey) Daytime sleepiness (Epworth Sleepiness Scale–Revised for Children)	Lower income-to-needs ratio was associated with greater daytime sleepiness	SES significantly predicted daytime sleepiness ($p = .009$)
Philbrook 2020[5]	USA	adolescents recruited through flyers distributed at local elementary schools in semirural areas and small towns in Alabama US	252	16 (Mage = 15.79 years, SD±.81), 17 (Mage = 16.79 years, SD ± .81), 18 (Mage = 17.73 years, SD ± 1.00) years across the three waves	53	3-wave longitudinal	Income-to-needs-ratio (INR) derived from familial income range and reported house-hold size Perceived economic well-being	Sleep–wake processes—sleep quality and daytime sleepiness (Two scales of the well-established School Sleep Habits Survey)	Family chaos is an intervening or mediator variable in longitudinal associations between indicators of lower SES and poor quality of sleep or greater daytime sleepiness	*Lower INR and poor quality of sleep ($p < 0.01$) and higher levels of chaos ($p<0.05$) in which it acts as a mediator * Lower INR and daytime sleepiness ($p =0.350$) where chaos is an intervening variable ($p<0.05$) * Chaos is an intervening variable between economic well-being and both poor quality of sleep and daytime sleepiness ($p < 0.01$; $p<0.05$)
Adults and old people										

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Author	Country	Sample characteristics	Sample Size	Mean or range age (years)	% women	Type of study	SES measures	Sleep measures	Findings	Odd Ratio, p value, r
Breslau 1997[17]	USA	adults insured in a health maintenance organization in southeast Michigan	973	26-36	62.4	Cross-sectional	Education (<high school, high school, some college, college) Employment status (employed full-time vs employed part-time or unemployed)	Daytime sleepiness (five items from the Sleep-Wake Activity Inventory)	Those employed full-time had more sleepiness than those employed part-time or not employed	N/A
Doi 2003[39]	Japan	workers of a telecommunications company in Tokyo	4722	20-59	17.8	Cross-sectional	Education (< or >high school)	Excessive daytime sleepiness (ESS score >10)	EDS was not associated with educational status	*Education-EDS: OR=1.47, p = 0.001 *Marital status-EDS: OR=1.61, p=0.001
Hara 2004[22]	Brazil	1066 adults from the general population in Bambui	1066	NR	55.7	Cross-sectional	Years of education (0, 1–3, 4–7, 8+). Monthly personal income (none, <1, 1.0–1.9, ≥2.0 Brazilian minimum wages); Monthly family income (<2.0, ≥2.0 Brazilian minimum wages); Current employment situation (student, working, unemployed, retired)	Excessive daytime sleepiness three or more times per week with consequent impairment of daily activities	Lower family income was associated with EDS	*Marital status-EDS: p=0.559 *Education-EDS: p=0.138 *Employment status-EDS: p=0.001 *Income-EDS: p=0.001
Gander 2005[23]	New Zealand	adults from the general population	5441	30-60	54	Cross-sectional	Area deprivation index (divided in quintiles)	EDS (Epworth Sleepiness Scale score >10)	Being in the highest deprivation quintile was a significant independent predictor of EDS, compared to being in the	Ethnicity-EDS: OR=1.55, p < .0001

									lowest deprivation quintile	
Kim 2005[21]	USA	adults part of a cohort of employees in 5 state agencies in Wisconsin	2913	35-65 (46.6±7.9)	53.6	Cross-sectional	Education (some college or less, college graduate or higher)	Excessive daytime sleepiness (13-item questionnaire subjected to factor analysis)	Lower education was related to worse perceived sleepiness	Education-EDS: p=0.002
Baker 2009[20]	USA	women from the general US population	959	18-64 (45±11.7)	100	Cross-sectional	Employment status (working full-time, working more than one job, working part-time, student, homemaker, unemployed, retired, or disabled) Education (high school or less, graduated from high school, some vocational or college courses, graduated from college) Household income (<$35,000, $35,000–$75,000, >$75,000)	Sleep quality (single question, dichotomous) Daytime sleepiness (single question, dichotomous)	Having lower education was associated with more daytime sleepiness	Education-EDS: p=0.001
Grandner 2013[28]	USA	adults from the general US population	4081	46.54±16.55	48.05	Cross-sectional	Household income (above vs below $20,000) Education level (<9th grade, 9th to 11th grade, high school graduate, some college, college graduate) Access to private health insurance (yes vs no) Household food security (combination of 18	Sleep latency >30min (yes vs no) Insomnia symptoms (never, rarely, sometimes, often, almost always) Daytime sleepiness (never, rarely, sometimes, often, almost always) Sleep apnea symptoms (never,	Lower income was associated with difficulty falling asleep, lower education with sleep latency >30 min, non-restorative sleep, snorting/gasping and snoring, no private insurance with sleep	*Education-EDS: OR=1.04 *Income-EDS: OR=1.11 *Marital status-EDS: OR=1.24, p<0.05 *Ethnicity/Race-EDS: OR=0.8, p<0.05

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							items and categorised as full, marginal, low, very low)	rarely, sometimes, frequently)	latency >30 min and non-restorative sleep and lower household food security with all symptoms	
Jarrin 2013[38]	Canada	adults recruited from advertisements in Montreal	177	30-65 (45.3±6.3)	81.4	Cross-sectional	Objective SES: household income, years of education, employment status (employed vs. unemployed) Subjective SES: MacArthur Scale of Subjective Social Status (scale 1-10)	Sleep quality (PSQI Global score) Sleep latency (PSQI sleep latency subscale) Weekday sleep duration Weekend oversleep (difference between weekend and weekday total sleep duration) Daytime sleepiness (ESS)	Higher SES was associated with less daytime sleepiness. Subjective SES better predicted daytime sleepiness than objective SES.	*Household income – SES: r = 0.50, p<0,01 *Years of education – SES: r =0.26, p<0,01
Liviya NG 2014[37]	Australia	adults recruited from 10 workplaces in Melbourne	707	40.2±10.4	60	Cross-sectional	Education (nontertiary vs tertiary) Occupation (manager, professional, associate professional, clerical or service) Income per week (≥$2000, $1600–$1999, $1000–$1599, $0–$999)	Excessive daytime sleepiness (ESS score >10)	There was no association between SES and EDS	R = 0
Cunningham 2015[36]	USA	adults from the general US population		NR	NR	Cross-sectional	Educational attainment (years of completed schooling)	Sleep duration (<7, 7-8, >8 h) Fatigue (yes vs no) Excessive daytime sleepiness (yes vs no) Insomnia (yes vs no)	Higher educational attainment was associated with less excessive daytime sleepiness	*Education-EDS: p=0.0001

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Schwartz 2015[35]	Peru	2682 adults y from the general population of 4 Peruvian settings	2682	>35 (54.1±18.8)	49.4	Cross-sectional	Wealth index (based on current occupation, household income, assets and household facilities)	SDB symptoms: habitual snoring (self-reported snoring at least 3 nights per week); observed apneas (pauses in breathing or choking during sleep reported by a spouse or bed partner); excessive daytime sleepiness (modified ESS score >6)	Lower SES was associated with more excessive daytime sleepiness.	*SES-EDS: OR=1.41, p=0.006
Stringhini 2015[34]	Switzerland	adults from the general population in Lausanne	3391	40-81	47.4	Cross-sectional	Educational level (high, middle, low) Occupational position (high, middle, low)	Subjective sleep assessment: sleep quality (PSQI global score >5), sleep latency (>30 min), daytime sleepiness (ESS score >10), sleep duration (<5 h), insomnia (from 2 items in PSQI) Objective sleep assessment: total sleep time, sleep latency, slow wave sleep, sleep efficiency, stage shifts (in-home 1-night PSG in a subsample of 1569 participants)	Men with a low educational level or occupational position were more likely to suffer from poor sleep quality, short sleep duration, and insomnia. Men with a low occupational position were also more likely to have long sleep latency. Women with a low educational level were more likely to have long sleep latency and short sleep duration. Women with a low occupational position were	* Men with low educational and occupational position – ESS: p<0,001 *Men with low occupational position- long sleep latency: OR = 4,90 *Women with low education – long sleep latency and short sleep duration: OR = 2,09; OR = 2,26 *Sleep efficiency – low SES: p<0,05 *Low SES – higher stage shifts: p<0,05

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									more likely to have long sleep latency, excessive daytime sleepiness and short sleep duration. Participants with low SES had lower sleep efficiency and higher stage shifts in PSG.	
Miner 2018[33]	USA	community-dwelling elderly persons	357	78-102 (84.2±4.4)	67.8	Cross-sectional	Education (high school vs higher)	Epworth Sleepiness Scale (≥10)	No association between education and EDS	R = 0
Kolla 2020[7]	USA	community-dwelling adults	5692	18-60	27.4	Cross-sectional	Family income (low, low-average, high-average, high) Employment status (working, student, homemaker, retired)	Interview	The prevalence of EDS was lower in adults with a higher family income No association between EDS and employment status	*EDS – low income: OR: 1,21 *Low average income: OR = 1,36 *High average income: OR: 1,24 *EDS – workers, students, homemakers or retired: OR = 0,88-0,89
Mokarami 2020[13]	Iran	workers in a brick factory	90	22-68 (35.6±4.3)	0	Cross-sectional	Education (elementary, diploma, university) Occupational title (office vs line workers)	Epworth Sleepiness Scale	No association between education and EDS Office workers had lower ESS scores than line workers	Occupation-EDS: p=0.0001

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SES = socio-economic status; PSQI = Pittsburgh Sleep Quality Index; DSM = Diagnostic and Statistical Manual of Mental Disorders; SDB = sleep-disordered breathing; ESS = Epworth Sleepiness Scale; EDS = excessive daytime sleepiness; OSA = obstructive sleep apnea; ICD = International Statistical Classification of Diseases and Related Health Problems; BIISS = behaviorally induced insufficient sleep syndrome, NR = Non Reported

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4- DISCUSSION

The aim of the present systematic review of observational cohort and cross-sectional studies is to provide the current status of knowledge on the link between socioeconomic position (SEP) and excessive daytime sleepiness (EDS). Overall, a lower educational level, a lower income and full-time employment were associated with more excessive daytime sleepiness (table 1). EDS symptoms are prevalent in women, especially those with a low income or no job [20]; and finally children and adolescents with difficult living conditions or people working part-time reported more sleep disturbances [19, 23, 27].

EDS was evaluated among young children and minors, a population in which development and growth rely on many physiological processes, including sleep. However, their sleep needs are often unmet. The actual average number of hours slept for minors was 6,7 hours on weekdays and 7,4 on weekends [17, 22, 37, 40]. EDS was inversely related to the number of hours of sleep and was associated with lower grade average and elevated scores of anxiety and depression [13, 17, 41]. These results, along with other studies, show that sleep disturbances are linked to poor academic performance, cognitive impairment and mental issues [36, 42, 43]. Disruptive sleep environment, conditions non-conducive to sleep or great worries could explain why children living in disadvantageous conditions have more sleep disturbances [20]. Moreover, the omnipresence of technological devices, the commotion of urban environment as well remunerated work influences their sleep duration and quality [13, 43].

Low SEP was strongly associated with poor sleep quality in adults. Important factors such as workload, varying shifts, family commitments or financial stress could account for the observed disparity in the burden of sleep disturbances on people with low SEP [34]. This association persists even after the adjustment for other sociodemographic, psychological or behavioral factors [34].

Moreover, EDS symptoms seem to be more frequent in women, especially in those with a lower family income or unemployed [20]. Women consider psychological factors to be the most important causes of sleep disturbances [20, 44, 45], therefore a low SEP could be perceived as a bigger burden in females rather than males. Furthermore, anxiety is significantly more common in females, however, the psychological stress could be a consequence rather than a cause [44, 45]. Women included in sleep health studies are often of the children bearing age, therefore, the higher number of sleep disturbance complaints could be due to the presence of young children [27, 44, 45].

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Excessive daytime sleepiness was also significantly associated with mental disorders, chronic physical conditions and greater functional disability among vulnerable populations [7]. Sleep disturbance is commonly observed in a wide range of psychiatric disorders reported by disadvantages communities [16, 46] and sleep disturbances increase negative emotions and decrease positive emotional responses among these communities more than their pairs [47].

EDS also seems to be more prevalent in low SEP individuals with chronic conditions than high SEP people with the same chronic conditions [48]. These chronic conditions such as diabetes, arthritis, obesity have been linked with a poor quality of sleep [7, 35, 48], which in turn explains in part the high prevalence of sleep disturbances that have been observed in the elderly population [22, 37, 43].

The lack of a significant association between sleep disturbances and SEP in geriatric research may be due to the presence of comorbidities. Multiple chronic diseases can cause bodily pain and can cause sleep disturbance independently of SEP. Reports of daily bodily pain account for 35% of complaints of sleep disturbance, including EDS [48].

Other factors that contribute to sleep problems in old age independently of SEP are changes in social engagement and lifestyle [49]. As their daily demands diminish and lifestyle becomes more sedentary, alteration in their sleep might not be as noticeable [50]. Furthermore, there are normal physiological alterations in sleep that arise with older age [51]. These changes include shortened nocturnal sleep duration as well as a higher frequency of daytime napping [51]. Although more studies are required to understand the association between sleep disturbances and SEP, findings of this review pointed out a potential relationship which deserves more investigations. As previously mentioned, the older population often suffer from multiple diseases, therefore, those with no health insurance might be more worried about their medical expenses, which in turn might impair their sleep quality [51].

Given the wide range of negative impacts associated with EDS, further research needs to be conducted to raise awareness among healthcare workers and improve clinical guidelines. The temporality of the relationship between EDS and SEP needs to be further assessed in longitudinal studies, rather than cross-sectional, that can discern the direction of the interaction and allow causality interpretations on how SEP influences EDS. Social class is a strong predictor of health outcomes and yet, it is a variable which remains particularly underexamined in sleep science. It is vital to gather more information about the contribution of other SEP parameters on EDS, such as access to insurance, ethnicity or immigration status. Future research should carefully investigate the interactions between sociodemographic and SEP parameters which could lead to better clinical interventions.

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5- CONCLUSIONS

Modern medical care revolves mainly on a biomedical model where quantitative measurement are very often considered as the gold standard for clinical practice as well as public health administrators. However, this approach has limitations in assessing long-term health outcomes and their relationship with socioeconomic disparities. SEP is already considered as an important determinant for many health outcomes, but if SEP is embedded in experimental design in psychosomatic research, biomedical research and clinical practice as a constant variable regardless of outcome; it will move forward future investigations. It is a challenge to capture the multidimensional nature of SEP, which highlights the need for better measures that would be comparable among various populations and across different types of studies. Future research is still required to understand how socioeconomic status, social class and socioeconomic position influences sleep health while analyzing possible mediators and moderators on the pathway.

Conflict of interests: The authors have no competing interests to report.

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