

INTRODUCTION

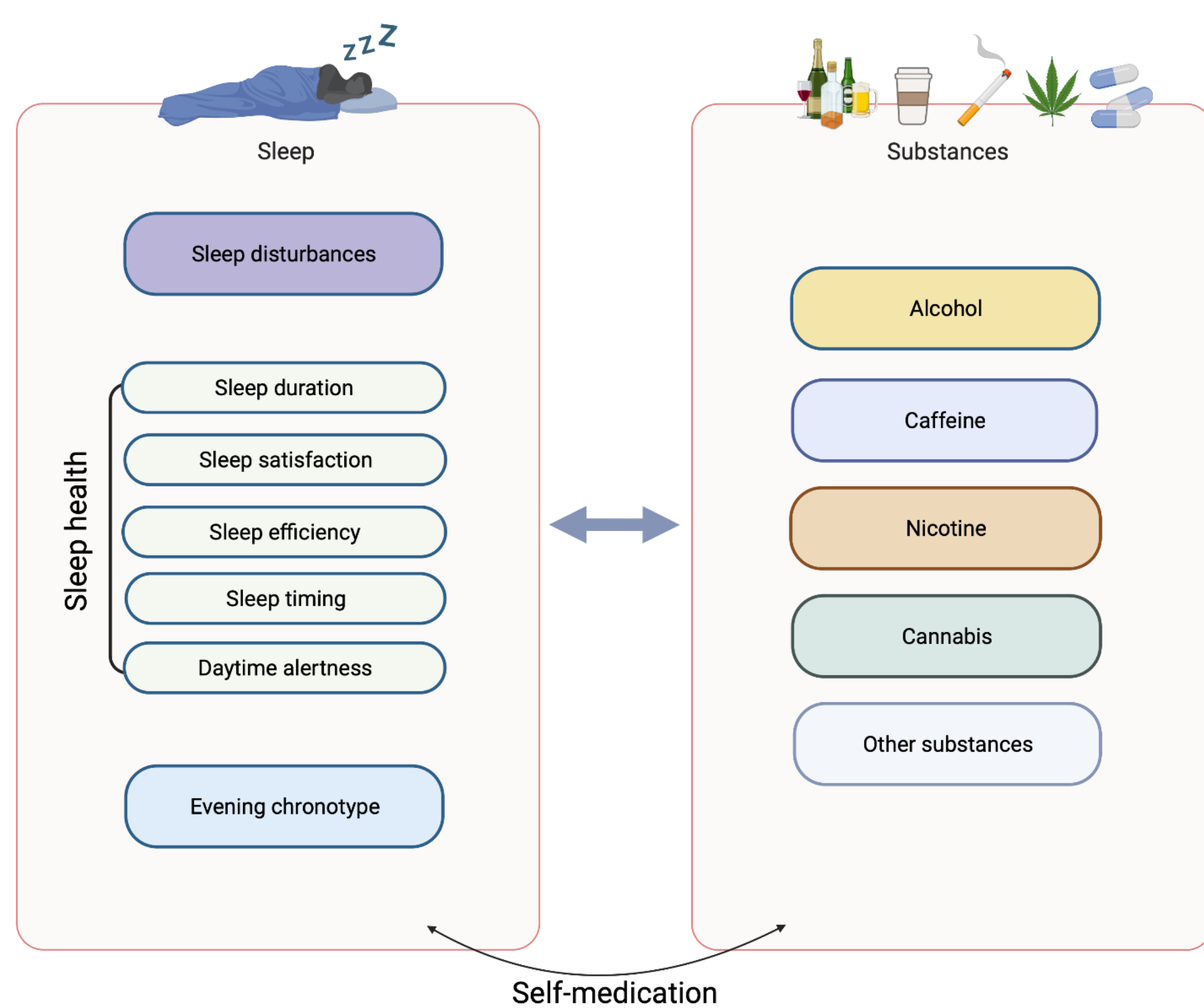
During young adulthood (18-30 years) there is a parallel increase in sleep problems^{1,2} and problematic substance use^{3,4}. This poses risk for the overall health of young adults, as sleep problems and substance use appear to be bidirectionally linked⁵. One proposed underlying mechanism for this bi-directional association is self-medication: the experience of sleep-wake difficulties may prompt the use of sleep promoting⁶ and/or wake-enhancing substances⁷, activating a vicious circle⁸. Nonetheless, the literature is highly variable in terms of sleep dimensions and substances considered. Adopting a framework that accounts for the multidimensionality of sleep health and the effect of different substances, we organized and synthesised the literature on the association between substance use and sleep in young adults.

METHODS AND RESULTS

In the present work, we adopted a multidimensional view on sleep, considering sleep disturbances, circadian characteristics, and sleep health's dimensions as defined by Buysse⁹. We also considered separately different substances. Following PRISMA guidelines, we systematically searched PubMed, PsycINFO, and Scopus databases. After screening of reports against inclusion/exclusion criteria, we included 46 reports (36 cross-sectional, 4 case-control, and 6 prospective studies). We performed meta-analytic calculation with odds ratios (ORs) and confidence intervals (CIs) when studies were comparable enough in terms of sample composition and assessment of sleep dimensions. Possible sources of heterogeneity were considered.

Literature organization

Framework used to organize and synthesize the literature on the association between sleep and substance use in young adults.



Meta-analytic findings

Higher odds of sleep disturbances were found among those consuming caffeine (OR: 1.69; 95%CI: 1.40-2.03) and nicotine (OR: 1.36; 95%CI: 1.15-1.61). Results on alcohol were inconclusive. No significant effect was detected for sleep duration.

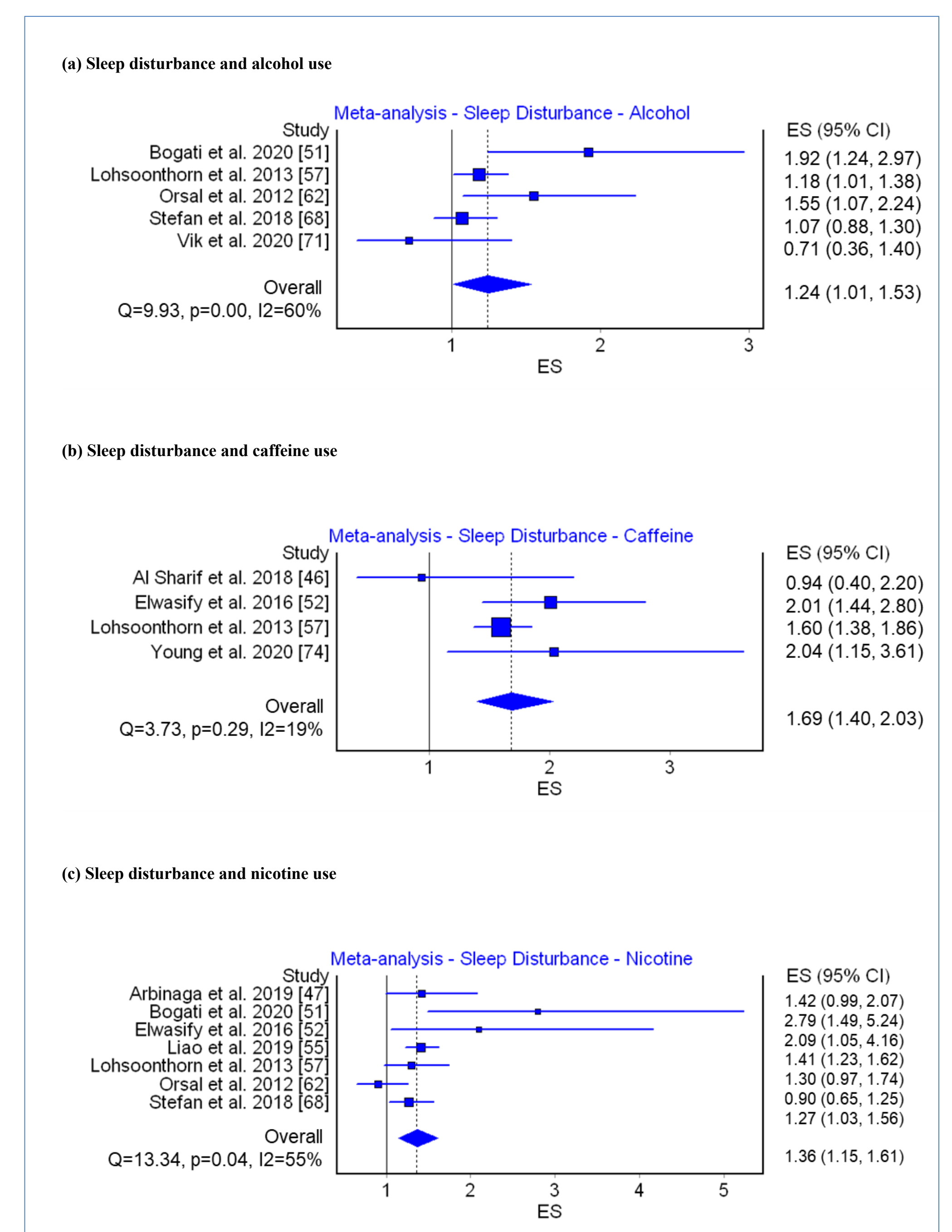
Narrative findings

Narrative findings yielded the following results:

- daytime dysfunction was associated with alcohol and caffeine use;
- poor sleep satisfaction was associated with nicotine use;
- few evidence were available for the other sleep health dimensions;
- evening chronotype was associated with alcohol, caffeine, and nicotine use.

Few studies focused on cannabis or self-medication. For the latter, studies indicate that, among users, self-medication with alcohol/cannabis is associated with more negative effects of substance use on sleep health.

Longitudinal results were inconclusive, highlighting a gap in the literature for this specific age range.



Forest plots of random effect meta-analytic models: pooled odds ratios (ORs) of sleep disturbances.

CONCLUSIONS

We found a distinct pattern of associations between different substances and different sleep outcomes. The most robust association was between caffeine use and sleep disturbances. Individual studies suggest that excessive alcohol use is associated with alterations in sleep health. We noted a lack of literature on most sleep health dimensions, except for sleep duration and daytime sleepiness. Self-medication was also seldom investigated in association with sleep health.

A multidimensional view on sleep is useful to understand its interaction with substance use in a young population. More investigations are needed to understand the effect of different substances on sleep health dimensions, and the role of motivations for use. Prospective data are particularly needed to follow the parallel increase in substance use and sleep disturbances during young adulthood. These insights could help to design preventive and clinical interventions aimed at breaking the vicious circle between sleep alterations and substance use in young adulthood.

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