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Original Article

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Sleep health improvement trajectories after a pandemic: insights from a national health survey

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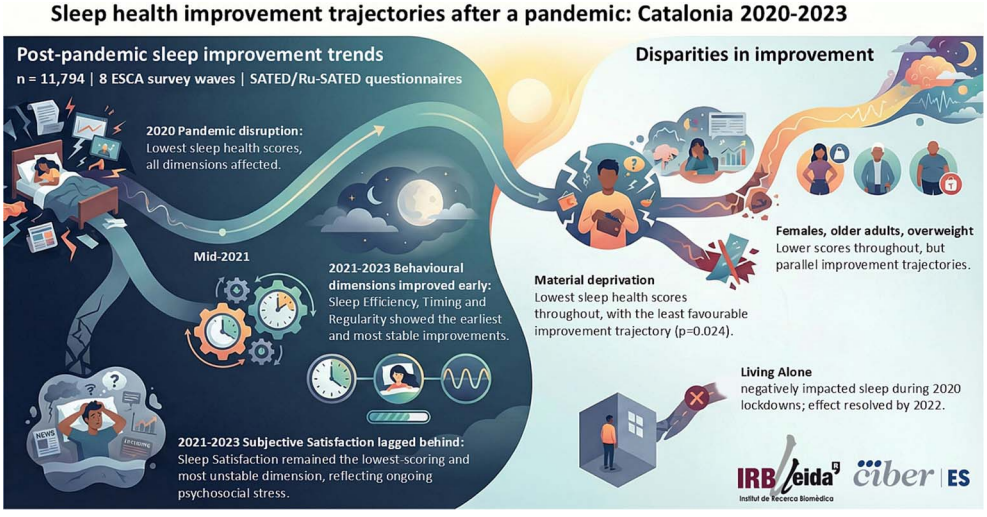
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Abstract

Study Objectives: This study aimed to evaluate sleep health improvement trends in Catalonia, Spain, from 2020 to 2023 following the COVID-19 pandemic, and to identify disparities across demographic and socioeconomic groups.
Methods: This repeated cross-sectional study analyzed 11 794 responses from eight waves of the Catalan Health Survey. Sleep health was assessed using the SATED and Ru-SATED questionnaires, covering six dimensions: Satisfaction, Alertness, Timing, Efficiency, Duration, and Regularity. Trends over time were evaluated, and stratified and interaction models assessed differences by sex, age, BMI, material deprivation, comorbidity burden, and living situation. Survey weights ensured population representativity.
Results: Sleep health improved from mid-2021, then stabilized. Efficiency plateaued by late 2020, while Satisfaction remained the most unstable dimension. Sleep regularity diminished during the 2020 lockdowns but improved promptly afterward. Females consistently scored lower than males, though their improvement trajectories were similar (p-for-interaction = .906). Older adults (65+) and individuals with excess weight exhibited distinctive improvement trends (p-for-interaction = .023). Material deprivation was the strongest predictor of poor sleep health and delayed improvement (p-for-interaction = .024). Living alone had a temporary negative impact during lockdowns, which resolved by 2022. Finally, comorbidity burden affected baseline scores but not improvement trends (p-for-interaction = .467).
Conclusions: Sleep health improvement post-pandemic was uneven across sleep dimensions and population subgroups. Behavioral sleep dimensions improved earlier, while subjective satisfaction lagged. Socioeconomic factors, particularly material deprivation, were strongly associated with poorer and slower improvements. These findings highlight the importance of incorporating sleep health into pandemic preparedness and tailoring interventions to address both behavioral and structural determinants of health.

Key words: sleep health; COVID-19 pandemic; improvement trajectories; socioeconomic disparities; epidemiology

Graphical Abstract



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Statement of Significance

This study offers new insights into how sleep health changed in the general population following the COVID-19 pandemic. By analyzing trends across multiple dimensions of sleep, we found that behavioral aspects improved early while subjective satisfaction remained low, likely reflecting ongoing psychosocial stress. The slower improvement observed among socioeconomically disadvantaged groups illustrates the influence of structural inequities on sleep outcomes. These findings highlight the need to integrate sleep health into public health response strategies and to design targeted interventions that address both behavioral and social determinants. Future work should explore targeted interventions and policies that promote equitable sleep health in the context of public health crises and their posterior transition periods.

Introduction

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, had a profound global impact. Since its emergence in late 2019, COVID-19 has led to significant morbidity and mortality, with millions of deaths worldwide [1]. Beyond the immediate health effects [2] and persistent health issues known as Post COVID-19 condition [3], the pandemic had a deep societal impact [4]. It significantly disrupted regular lifestyles, impacting health behaviors and daily activities across all age groups [5]. It also imposed substantial restrictions on social interactions, deeply affecting work practices, relationships, and daily routines [4]. These disruptions have led to significant physical but also psychological effects on populations worldwide [6].

Sleep health is essential for overall well-being, influencing both physical and mental health [7]. Adequate sleep supports cognitive functions such as memory consolidation, learning, and emotional regulation. It also plays a crucial role in physical health by bolstering immune function, maintaining cardiovascular health, and regulating metabolic processes [7]. Poor sleep can lead to a range of adverse outcomes, including increased risk of chronic conditions like obesity, diabetes, and heart disease [7]. Therefore, maintaining good sleep health is vital for sustaining optimal health and quality of life.

The COVID-19 pandemic had a significant impact on sleep health across the globe [8–10]. The combination of heightened stress, anxiety, and disruptions to daily routines led to widespread sleep disturbances [8, 11]. Studies have shown that more than 35% of the general population experienced disrupted sleep during the pandemic [8]. Additionally, individuals diagnosed with COVID-19 reported even higher prevalence of sleep problems, with nearly 75% experiencing difficulties [8]. Given the significant impact of the COVID-19 pandemic on sleep health, this manuscript aims to investigate sleep health improvement trajectories from 2020 to 2023 at the population level in Catalonia, Spain, utilizing data from the Catalan Health Survey (ESCA). Additionally, it examines how various factors, including sex, age, body mass index, economic difficulties and material deprivation, burden of comorbidities, and number of household members, influence sleep improvement trajectories.

Materials and Methods

Design, population and data collection

This was a repeated cross-sectional study based on the ESCA 2020-2023 survey [12]. For each of the eight survey waves, an independent multistage probability sample was drawn to be representative of the non-institutionalized population in Catalonia, stratified by age, sex, health region, and municipality size. Importantly, respondents were not followed longitudinally; each wave comprised different individuals, and the data therefore represent population-level trends rather than individual trajectories. The eight waves were: wave 20 (January–June 2020, $n = 1082$), wave 21 (July–December 2020, $n = 1341$), wave 22 (April–June 2021, $n = 1454$), wave 23 (June–December 2021, $n = 3373$), wave 24 (January–June 2022, $n = 2413$), wave 25 (August–December 2022, $n = 2411$), wave 26 (January–June 2023, $n = 2415$), and wave 27 (July–December 2023, $n = 2414$), involving a total of 16 903 respondents. Surveys were administered by professional interviewers using computer-assisted interviews. In order to achieve a 100% response rate, sampling units that could not be located or declined to participate were replaced by units with the same characteristics in terms of age group, sex, municipality, and nationality. Regardless of the harsh conditions imposed by the pandemic, especially in 2020, including the need to stop survey field work in several periods and a reduced sample size in the initial waves, it is deemed that the yearly sample sizes guaranteed population representativity at the Catalan level after using appropriate weighting. Additional methodological details on ESCA survey procedures can be found in the online supplement.

Each wave's survey included nearly 500 questions covering various aspects of health status, health-related behaviors, and the use of health services. These questions were organized into the following categories: sociodemographic variables (such as occupation and education), health status and quality of life, chronic diseases, unintentional injuries, pharmacological treatments, daily life limitations and disabilities, preventive practices, social support, mental well-being, dietary habits, physical activity and mobility, tobacco use, alcohol consumption, cannabis use, healthcare resource utilization (including planned and unplanned hospitalizations, visits, and consultations over the past 15 days and year), material deprivation, and sleep habits. Full details on the ESCA survey composition can be found in the online supplement.

Among the key variables for the current study, participants were asked about sleep duration during last week: "During the last week, how many hours per night did you sleep on average?"; as well as their overall sleep health by means of the self-reported 6-item Ru-SATED scale [13, 14]. All participants completed all six items, allowing computation of both Ru-SATED and SATED scores. The Ru-SATED questionnaire is a brief, validated self-report tool that assesses six key dimensions of sleep health: Regularity, Satisfaction, Alertness, Timing, Efficiency, and Duration with a total scoring from 0 to 12, where 12 indicates optimal sleep health. The SATED scale, identical to the Ru-SATED but excluding Regularity, thus with 5 questions and a total score ranging from 0 to 10, was also used. Age groups were categorized as follows: 15–44 years, 45–64 years, and 65 years and older. Material deprivation, measuring poverty based on the inability to afford essential items as adopted by the European Commission and collected by Eurostat, identifies

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those who cannot afford at least three of nine items: paying rent or bills, handling unexpected expenses, keeping their home warm, eating meat or protein regularly, going on holiday, owning a car, a washing machine, a color TV, or a telephone. Severe material deprivation corresponds to the inability to afford four of the nine previously listed items. The burden of comorbidities and the number of household members were also considered.

The ESCA survey is an official statistic of the Catalan Government. It was approved by the Consultants' Committee of Confidential Information Management from the Catalan Health Department, according to the year 2000 revision of the Helsinki Declaration.

Statistical analysis

Weighting adjustments were applied to achieve representative frequencies, accounting for the oversampling of less populated areas. Continuous variables were summarized as means with standard deviations (SD), while categorical variables were presented as percentages. To analyze trends in sleep duration and Ru-SATED scores from 2020 to 2023, data was presented according to survey waves. Trends in the different dimensions included in the Ru-SATED scale (regularity, satisfaction, alertness, timing, efficiency, and duration) were also analyzed. Inferential statistics included *t*-tests and ANOVA to compare group means and identify significant differences, and chi-square tests to examine relationships between categorical variables. Given that ESCA employs independent samples at each wave, with no repeated measures on the same individuals, weighted linear regression models were used to assess trends in continuous Ru-SATED and SATED scores across survey waves, and weighted logistic regression models were used to assess the likelihood of reporting the optimal score ("Always") in each Ru-SATED dimension. In all models, survey wave was treated as a categorical predictor, with Wave 20 (January–June 2020) as the reference category. Standardized mean differences (SMDs) were calculated to quantify effect sizes independent of sample size, computed as the difference in means divided by the pooled SD. Effect sizes were interpreted using conventional thresholds: 0.2 (small), 0.5 (medium), and 0.8 (large). Stratified models by sex, age group, BMI category, material deprivation, comorbidity burden, and number of household members were fitted to identify disparities across population subgroups and identify potential vulnerable groups. To formally test whether improvement trajectories differed among subgroups, models including interaction terms (wave × stratifying variable) were fitted, with statistical significance of interactions assessed using Wald tests. R statistical software, version 3.3.1, was used for all the analyses. All tests were two tailed, and *p*-values <.05 were considered statistically significant. Y-axis ranges in figures were optimized to visualize temporal trends and subgroup differences.

Results

After the exclusion of 4312 surveys corresponding to children up to 14 years old (whose survey answers are reported by their parents and do not include the Ru-SATED questionnaire), and 797 surveys from respondents working in nightshift (who do not answer to the Ru-SATED questionnaire), a total of 11 794 surveys were included in the analyses. Given the design of the ESCA survey, the characteristics of the participants are representative of the Catalan population in each of its waves. Table 1 shows a summary of the main characteristics of the Catalan population in 2020. A non-weighted description of the population across study waves can be found in the online supplement (Supplementary Table 1).

Table 1. Main characteristics of the Catalan population in 2020

	mean (SD) or proportion
Age, years	47.8 (18.5)
Sex, female	51.5%
BMI	
Underweight (BMI < 18.5)	1.6%
Normal weight (BMI ≥ 18.5 & <25)	47.7%
Overweight (BMI ≥ 25 & <30)	33.6%
Obese (BMI ≥ 30)	17.1%
Self-perceived health status, good health	82.0%
Comorbidities	26.2%
No comorbidities	24.7%
One to three comorbidities	49.2%
Four or more comorbidities	26.0%
Smoking status	
Current smoker	24.6%
Former smoker	22.4%
Never smoker	53.0%
Household members	
Living alone	11.6%
Two members	35.9%
Three or more members	52.5%
Material deprivation	
No material deprivation	66.2%
Non-severe material deprivation	29.5%
Severe material deprivation	4.4%

BMI, body mass index. Weighting was applied to achieve representative frequencies, accounting for the oversampling of less populated areas.

The SATED and Ru-SATED scores by sex across eight ESCA waves from 2020 to 2023 are shown in Figure 1. Both SATED and Ru-SATED scores showed an improvement in the second wave of 2021 with previous waves' scores being fairly constant. Scores subsequently plateaued, with some variability observed after 2021. Sex-stratified analyses revealed consistently lower sleep health scores among females relative to males throughout the study period, although having similar improvement trajectories. To quantify the magnitude of observed changes independent of sample size, we calculated SMDs. The SMD comparing the initial lockdown period, wave 20 (early 2020), to the period of highest scores, wave 23 (late 2021), was 0.25 for Ru-SATED and 0.24 for SATED in the overall sample, corresponding to small effects by conventional thresholds. Effect sizes were modestly larger in males (Ru-SATED: 0.30; SATED: 0.29) than in females (Ru-SATED: 0.21; SATED: 0.21). Notably, SMDs comparing wave 23 (late 2021) to wave 27 (July–December 2023) were negative (Ru-SATED: −0.16; SATED: −0.15), indicating that scores plateaued or slightly declined after late 2021 rather than continuing to improve. Overall, score distributions exhibited a ceiling effect, with values clustering toward the upper end of both scales, which contextualizes the modest absolute magnitude of observed improvements. Full-scale box-and-whisker plots are provided in the Supplementary material (Supplementary Figure 1) to illustrate score distributions. Mean (95% CI) total scores for SATED and Ru-SATED across all eight waves, stratified by sex, are provided in the Supplementary material (Supplementary Table 2).

Figure 2 presents the distribution of response options across each of the six dimensions of Ru-SATED (Satisfaction, Alertness, Timing, Efficiency, Duration, and Regularity) over the ESCA survey waves. The proportion of participants selecting "Always" increased steadily across most dimensions, particularly in Efficiency, which reached stable levels by the second wave of 2020. While Duration and Regularity did not improve in the second half

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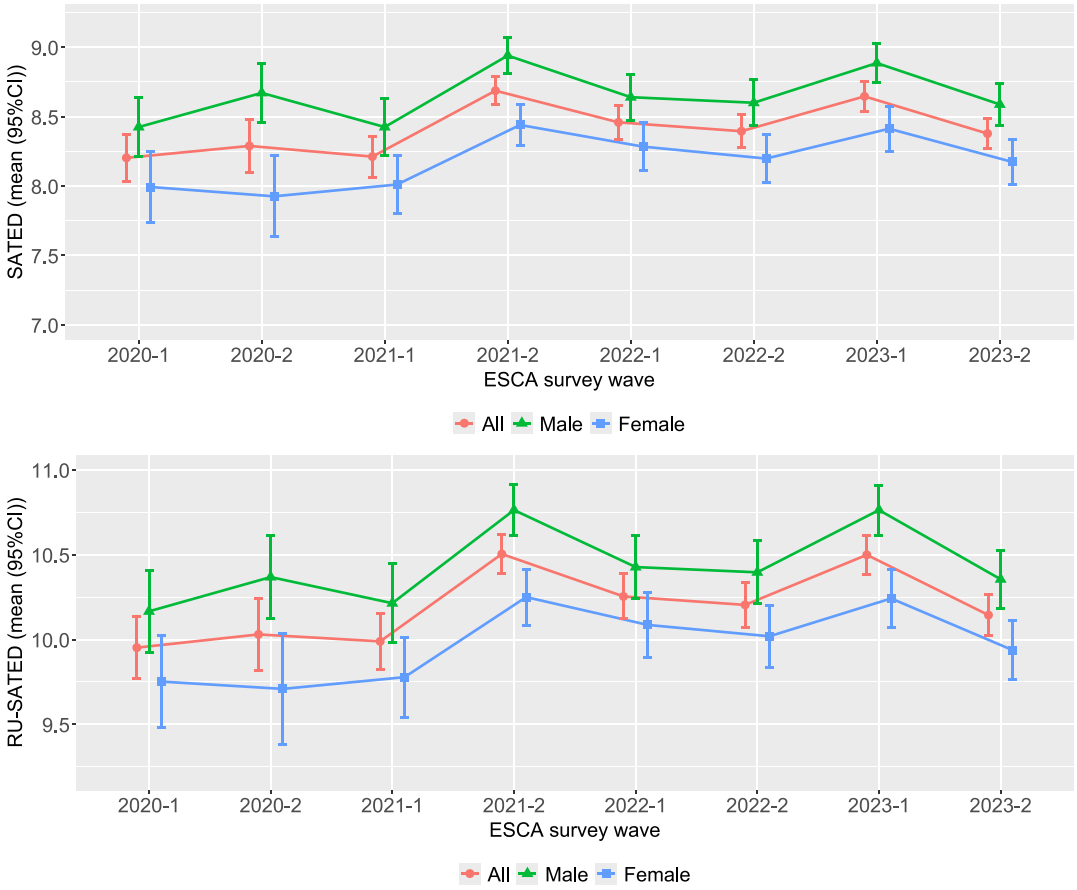


Figure 1. SATED and Ru-SATED scores by sex across ESCA waves from 2020 to 2023. Data presented as mean (95% confidence interval).

of 2020, Alertness and especially Timing showed first signs of improvement. In contrast, Satisfaction showed the more modest improvements and was the lowest scoring dimension across the waves. Mean (95% CI) scores for each individual Ru-SATED dimension across all eight waves, stratified by sex, are provided in the Supplementary material (Supplementary Table 3).

These results have been further explored in Figure 3, which shows the results of logistic regression models assessing the likelihood of reporting "Always" in each Ru-SATED dimension across ESCA waves and offering a clearer longitudinal view of improvement patterns. Consistent with the trends observed in response proportions, Efficiency showed the earliest and most stable improvement, with elevated ORs already evident in the second wave of 2020. Duration and Regularity did not show improvement during the second half of 2020, but began to improve in subsequent waves. Interestingly, Alertness and especially Timing displayed early signs of improvement during this period, suggesting a shift in behavioral regulation before improvements in sleep quantity. In contrast, Satisfaction remained the lowest scoring dimension throughout the study period, with modest and unstable ORs, reinforcing its status as the most resistant to improvement.

Finally, Figure 4 presents the Ru-SATED scores across the ESCA survey waves, stratified by sex, age group, BMI categories, material deprivation, burden of comorbidities, and number of household members, highlighting persistent differences in sleep health improvement trajectories among population subgroups. Females showed consistently lower predicted scores compared to males. However, the trajectories were mostly parallel and there was no interaction between sex and waves ($p = .906$). Regarding age groups, younger (15–44 years) and middle-aged adult (45–64 years) showed parallel trajectories with younger adults scoring slightly better across all waves. However, older adults (65+ years) showed a significant, slower, less consistent improvement, indicating age-related disparities in sleep health resilience. In terms of BMI, individuals with excess weight (overweight and obesity) consistently scored lower than those with underweight or normal weight, with a visible separation in trajectories and significant interaction with the waves ($p = .023$). The most pronounced disparities were observed in material deprivation, where individuals experiencing severe deprivation had substantially lower predicted scores and a worse improvement curve compared to those with non-severe deprivation, which in turn showed lower scores but similar trajectory when compared to subjects without material deprivation. The material deprivation-wave interaction was statistically significant ($p = .024$). This suggests that socioeconomic factors had the strongest and persistent impact on sleep health improvement during and after the pandemic. Regarding comorbidities, as expected those subjects with higher burden showed lower scores, but the improvement trajectories were parallel and the interaction was not statistically significant ($p = .467$) thus suggesting that comorbidities only affect the baseline sleep health rather than the improvement after a harsh situation. Finally, the number of household members had a direct impact only in the lockdown period (the two waves of 2020), improving in 2021 and reaching stability by 2022 making the overall p-for-interaction not statistically significant ($p = .693$).

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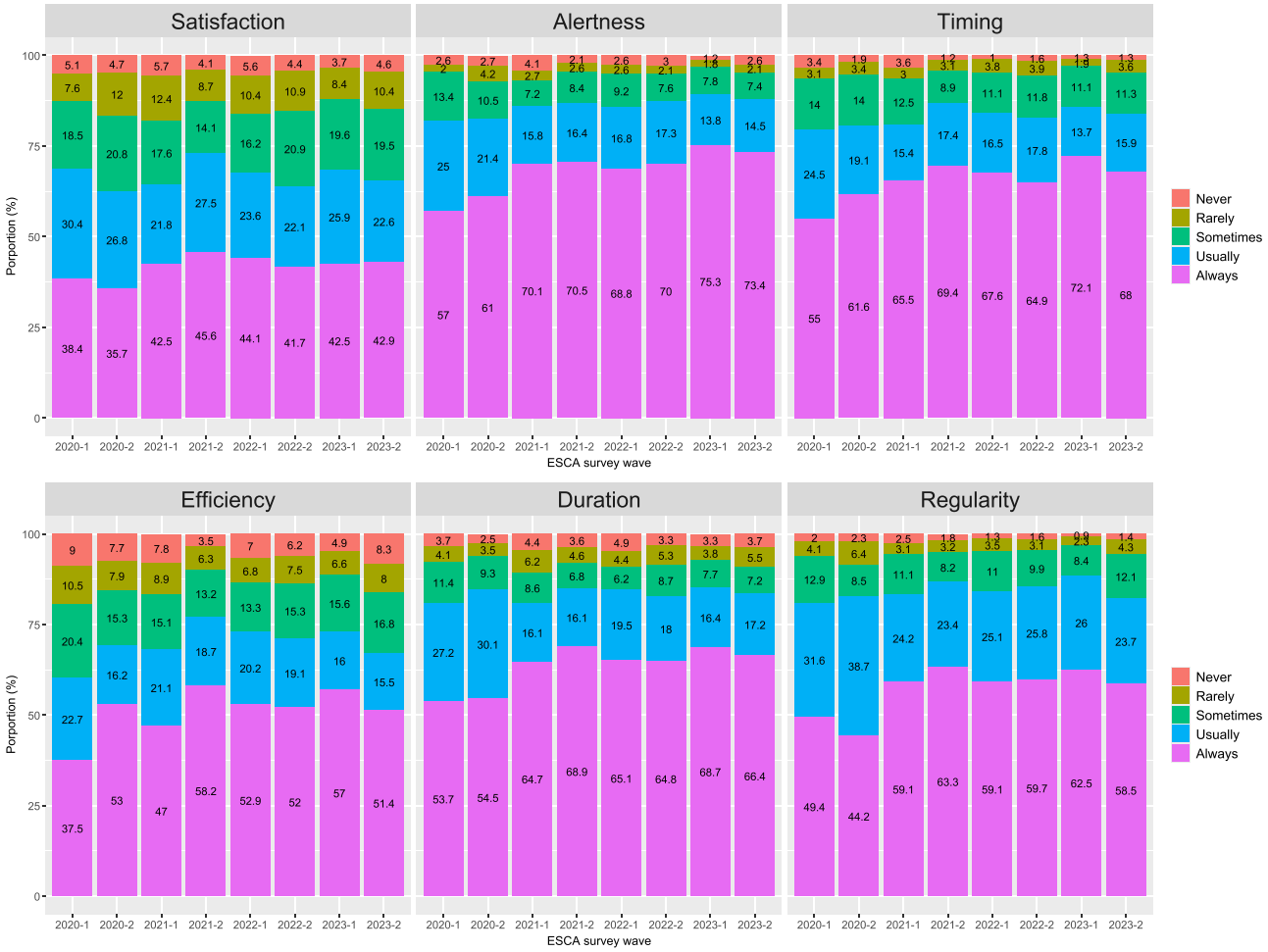


Figure 2. Distribution of the responses to the Ru-SATED questionnaire across ESCA waves from 2020 to 2023. Data presented as proportions (%) of responses.

Discussion

In this study, we examined sleep health trends in the Catalan population over eight ESCA survey waves from 2020 to 2023, using the SATED and Ru-SATED instruments. Overall, sleep health showed improvement from mid-2021, followed by stabilization with Efficiency showing the earliest and most substantial improvement, while Satisfaction remained the lowest scoring and most resistant to improvement dimension. Further analysis of individual Ru-SATED components revealed varied improvement patterns, with Timing and Alertness showing early signs of improvement, and Duration and Regularity improving more gradually. Interestingly, the improvement trajectories differed across population subgroups. Females, older adults, overweight or obese individuals, individuals with a higher burden of comorbidities, and those experiencing material deprivation consistently reported lower sleep health scores, as did those living alone in the periods of confinement. Among these, material deprivation showed the most pronounced and persistent impact combined with distinctive improvement trajectories, highlighting the role of socioeconomic factors in shaping sleep health outcomes during and after the COVID-19 pandemic.

Our unique study, covering a 4-year period since the very beginning of the pandemic through the post-pandemic period, significantly contributes to the documentation of the complex and uneven improvement of sleep health following the COVID-19 pandemic. However, it cannot provide data on the changes from before the pandemic to the early phases of it. The COVID-19 pandemic, marked by lockdowns, social distancing, and disrupted routines, led to widespread changes in sleep, physical activity, diet, and mental health [11]. Several studies focusing on the first lockdown reported an increase in sleep duration [9], especially in high school students, who previously slept less than the average [15]. This could reflect the impact of more flexible schedules and reduced social jet lag during lockdowns. However, this was not universal; a study of US adults found no change in average sleep duration, but an increase in the prevalence of both shorter and longer than recommended sleep [16]. A consistent delayed sleep timing, including later bedtimes and wake-up times, was also found [9, 15]. However, despite longer sleep for some, sleep quality generally worsened, with increased reports of insomnia, difficulty falling and staying asleep, and not feeling rested [8, 17]. Nightmares and napping also became more frequent [17, 18]. This seriously disrupted scenario is clearly captured by our study, with surveys from the 2020 waves reporting the lowest scores in all sleep health dimensions.

To our knowledge, no other study has fully described the improvement trajectories of the different sleep health dimensions after the pandemic. Following the acute phase of the pandemic, many health behaviors and psychological conditions remained negatively impacted. Sleep disturbances persisted, especially among individuals with Long COVID [19–23], who reported ongoing insomnia, daytime sleepiness, and fatigue. These symptoms

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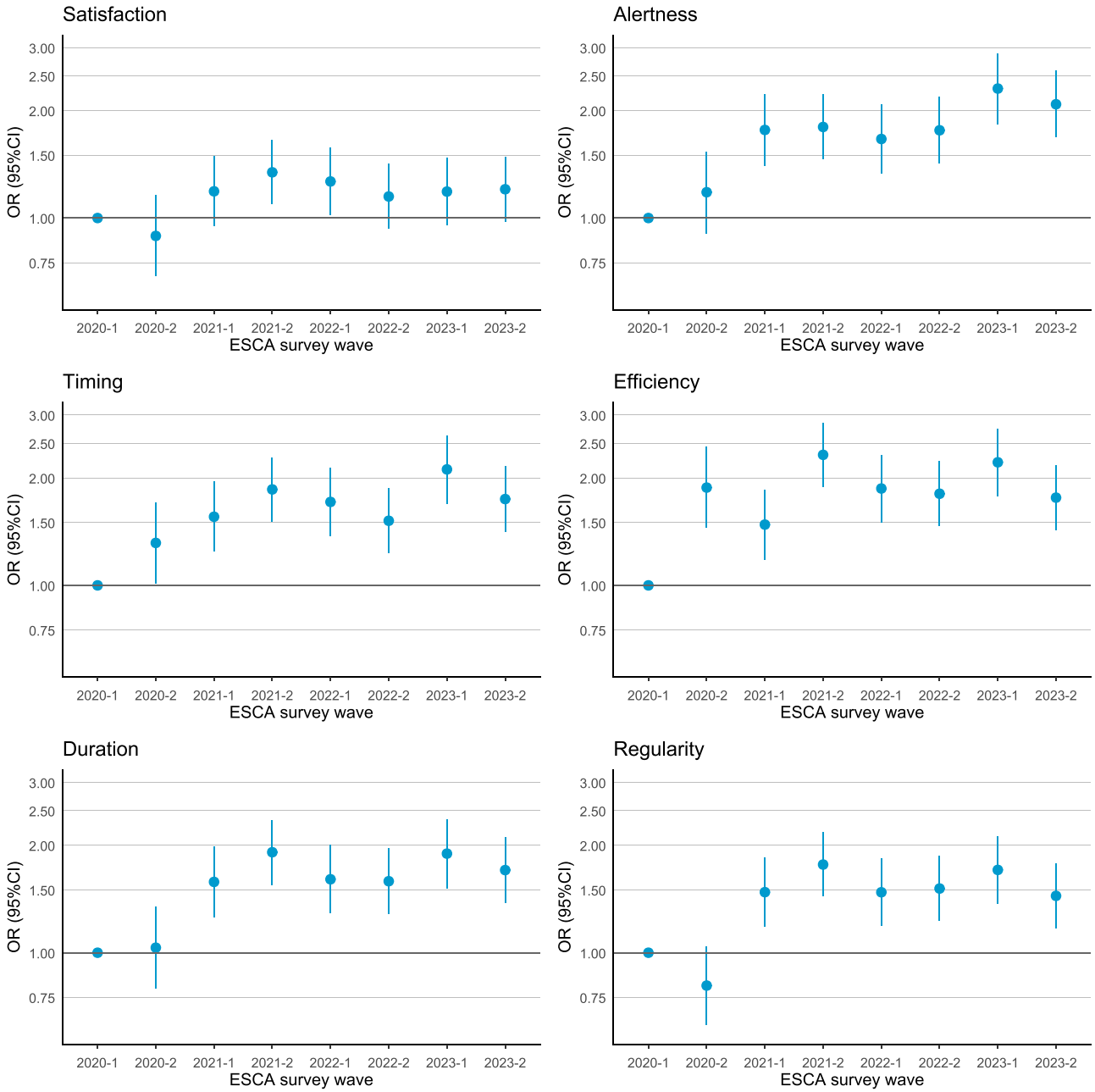


Figure 3. Logistic regression models assessing the likelihood of reporting the best score in each Ru-SATED dimension (answering "always" to the corresponding survey question) across ESCA waves from 2020 to 2023. Data presented as OR (95% CI).

were linked to long-term neurological and neuropsychiatric effects of the virus [23–25]. Even as lockdowns lifted, insomnia prevalence remained elevated compared to pre-pandemic levels, and sleep quality continued to correlate with psychological stress and somatic complaints [26, 27]. Finally, data from Chinese college students show positive changes in physical activity, depression and anxiety symptoms, and sleep quality in 2022 and 2024, although high perceived stress persisted [28]. Overall, our study reported Satisfaction being the lowest scoring Ru-SATED dimension throughout the entire period, echoing the findings of the above-mentioned studies showing increased difficulty falling and staying asleep, higher rates of insomnia, and reduced feelings of restfulness during and after the pandemic.

The clinical meaningfulness of the observed changes warrants careful consideration. The overall improvement from early 2020 to late 2021 corresponded to a small standardized effect size (SMD $\approx$ 0.25), and scores subsequently plateaued rather than continuing to improve. No minimal clinically important difference (MCID) has been established for the SATED or Ru-SATED instruments, limiting direct clinical interpretation. However, several considerations provide context. First, the observed effect sizes are comparable to those reported in behavioral sleep interventions, which typically yield SMDs of 0.2–0.5 for sleep quality outcomes, suggesting the population-level changes are within a range considered meaningful in intervention research. Second, consistent with Geoffrey Rose's prevention theory, even small shifts in the population mean can significantly reduce the prevalence of individuals in the high-risk tail of the distribution, translating to substantial absolute numbers of individuals experiencing better sleep health given Catalonia's population of approximately 7.5

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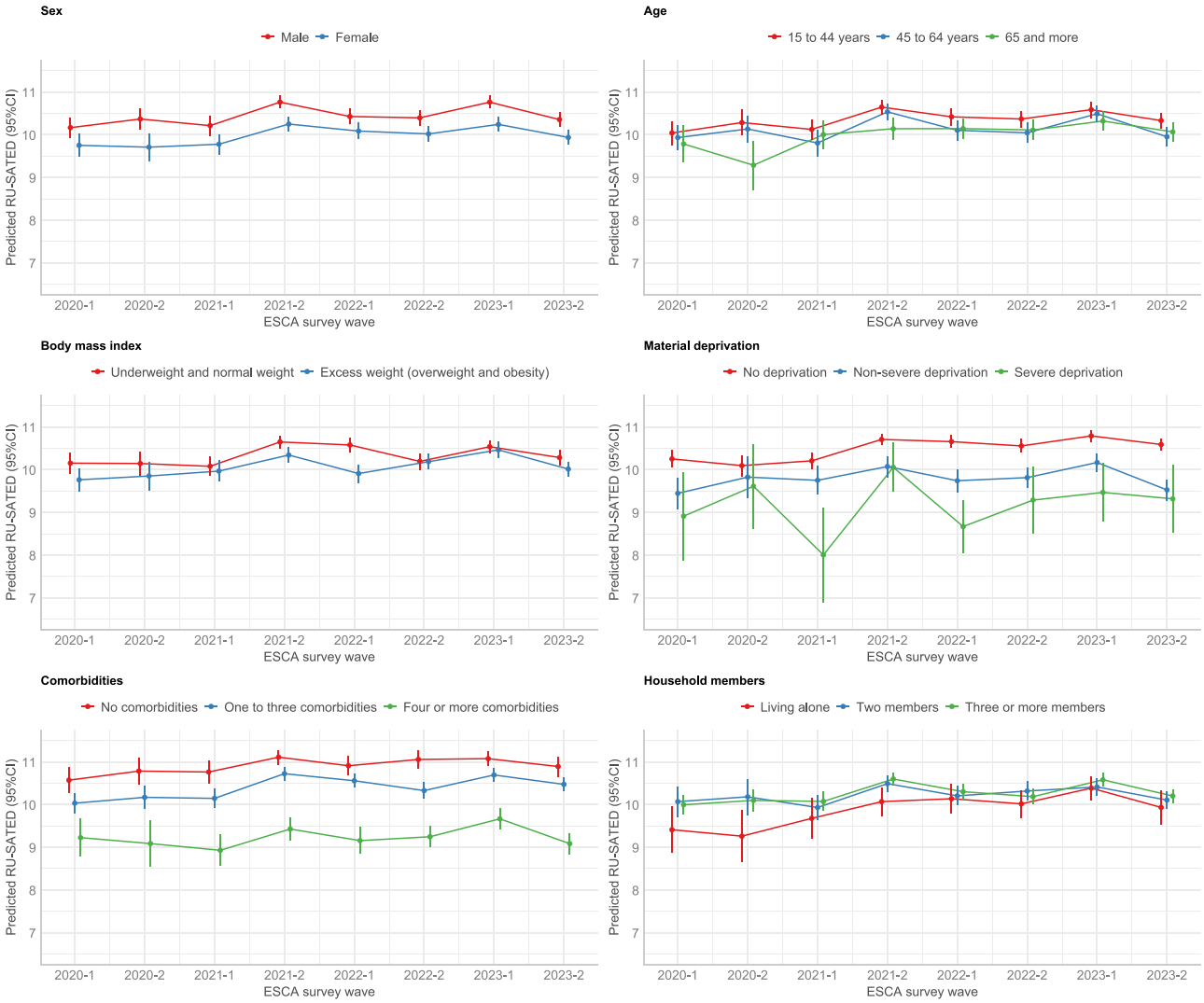


Figure 4. Ru-SATED scores across the ESCA survey waves, stratified by sex, age group, body mass index categories, material deprivation, burden of comorbidities, and number of household members. Data presented as mean (95% confidence interval).

million. Third, the observed changes occurred without targeted intervention, representing natural adaptation rather than treatment effects.

Importantly, our data highlight persistent disparities in sleep health improvement across demographic and socioeconomic groups. Females in our sample consistently reported lower sleep health scores, a pattern that mirrors widespread reports of higher stress, anxiety, and depressive symptoms among women before and during the pandemic. However, the improvement trajectories of men and women were completely parallel, suggesting similar improvement patterns. Older adults in our study showed slower and less consistent improvement, which corresponds with findings that this group experienced sustained declines in subjective well-being and increased vulnerability to psychological distress. Regarding body composition, individuals with overweight or obesity consistently scored lower than those with underweight or normal weight, with significantly distinct improvement trajectories. This could be related to highly prevalent pathologies in obese populations such as obstructive sleep apnea. The impact of material deprivation was particularly striking, with individuals experiencing severe deprivation showing the lowest predicted Ru-SATED scores and the least favorable improvement trajectory. As expected, the comorbidity burden had a significant impact on sleep health but not in the improvement trajectories, suggesting that comorbidities primarily influence baseline sleep health rather than the capacity for improvement following a major stressor. Finally, household composition had a transient but notable effect, as living alone was significantly associated with poorer sleep health during the lockdown periods of 2020, likely reflecting increased interpersonal stress or disrupted routines and indicating a temporal influence of household dynamics on sleep health during acute phases of societal disruption. Overall, these results are in line with studies reporting distinct changes in health behaviors during the pandemic according to socioeconomic deprivation, age, sex, or ethnicity [29–32]. This evidence suggests that financial hardship was the most strongly associated factor to worsened sleep and daytime functioning, and that lower socioeconomic status was a key predictor of poor sleep and mental health outcomes during and after the pandemic.

The results of this study offer important clinical insights for managing sleep health during future pandemics or periods of widespread societal disruption. The early and sustained improvement observed in behavioral sleep dimensions such as Efficiency and Timing, occurring without targeted interventions,

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suggests that these aspects of sleep health are relatively robust and responsive to the natural restoration of daily routines. Notably, no major public health campaigns specifically targeting sleep health were implemented in Catalonia or Spain during the study period; public health messaging focused primarily on infection prevention, vaccination, and general mental health support. The observed improvements in behavioral sleep dimensions therefore appear to reflect organic adaptation to the easing of pandemic restrictions rather than intervention effects. This implies that behavioral sleep hygiene interventions, while potentially valuable during acute disruption phases such as lockdowns, may offer diminishing returns once external circumstances normalize. In contrast, the persistent deficits in subjective sleep Satisfaction indicate that this dimension is more resistant to spontaneous improvement, likely reflecting its closer association with psychological well-being, stress, and anxiety. Public health strategies should therefore prioritize interventions targeting dimensions that lag behind, such as Satisfaction, which may benefit from cognitive-behavioral approaches or psychological support. The slower improvement among vulnerable groups, especially those experiencing material deprivation, highlights the need for targeted support strategies. Clinicians and public health professionals should prioritize mental health screening and sleep quality assessments in populations at higher risk, including women, older adults, and socioeconomically disadvantaged individuals. Moreover, the strong association between material deprivation and poor sleep improvement highlights the importance of integrating social support and economic relief measures into pandemic preparedness plans. Overall, sleep health should be recognized as both a clinical priority and a social determinant of health, with its improvement deeply shaped by mental well-being, social context, and structural inequalities, which reinforces the need for multidisciplinary strategies that address these interconnected factors.

A major strength of the current study is its use of a large, population-representative sample across eight consecutive survey waves, allowing for robust analysis of temporal trends in sleep health in Catalonia. The inclusion of both SATED and Ru-SATED instruments provided a multidimensional assessment of sleep health, capturing not only behavioral aspects but also subjective and functional dimensions. Stratified analyses by sex, age, BMI, and material deprivation further enriched the findings, revealing important disparities in improvement trajectories. However, the study also has limitations. The observational design precludes causal inference, and self-reported measures may be subject to recall or social desirability bias. The repeated cross-sectional design does not permit individual-level trajectory analyses (e.g. latent class growth modeling) that could identify distinct subgroups with differential patterns of change. Our stratified analyses and interaction tests identify population subgroups with different average trends but cannot capture within-group heterogeneity or individual-level improvement trajectories and their predictors. Additionally, while the ESCA survey is representative at the population level, it does not include institutionalized individuals or those without stable housing, potentially underestimating the impact of extreme deprivation. Finally, the lack of pre-pandemic baseline data limits the ability to quantify absolute changes in sleep health, although the repeated measures across waves provide valuable insight into relative improvement patterns. Consequently, the improvements we describe represent changes relative to the early pandemic period (first half of 2020) rather than recovery to pre-pandemic baseline levels. Whether sleep health returned to pre-pandemic levels, exceeded them, or remained below them cannot be determined from our data. We therefore use the term "improvement" throughout to describe the favorable changes observed over time, acknowledging that this does not imply return to a known prior state.

In conclusion, this study provides a comprehensive overview of sleep health changes in the Catalan population during and after the COVID-19 pandemic, highlighting both encouraging trends and persistent challenges. While certain behavioral aspects of sleep, such as efficiency and timing, showed early signs of improvement, subjective sleep satisfaction remained low throughout. The findings underscore significant disparities in improvement trajectories across demographic and socioeconomic groups, with material deprivation emerging as the most influential factor. These results emphasize the need for targeted public health strategies that address not only sleep hygiene but also the broader social determinants of health, ensuring equitable improvement and resilience in the face of future public health crises.

Supplementary material

Supplementary material is available at *SLEEP* online.

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Author contributions

JdB: Conceptualization, Methodology, Supervision, Writing—original draft, Writing—review & editing. EG-L: Methodology, Data curation, Formal analysis, Writing—original draft, Writing—review & editing. ADST: Writing—review & editing. MH-B: Writing—review & editing. FB: Writing—review & editing.

Disclosure statement

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Data availability

The data underlying this article were provided by the Catalan Health Department by permission. Data cannot be shared by the authors but will be shared on formal request to the Catalan Health Department through the official website of the Catalan Government (https://web.gencat.cat).

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