

ARTICLE

Boarding versus day-students: A mixed-methods analysis of sleep and its relationship with psychological distress

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Abstract

Background: Boarding students face unique challenges when entering school, including: adapting to a novel environment, where they are separated from family, friends and culture, for up to 40 weeks per year. A particular challenge is sleep. A further challenge is coping with the demands of boarding with its potential impact on psychological well-being.

Aims: To explore how boarders' sleep differs from that of their day-student peers, and how this relates to psychological well-being.

Sample and Methods: 309 students (59 boarding students and 250 day-students, at one Adelaide school) completed the School Sleep Habits Survey, Depression-Anxiety-Stress-Scale-21 (DASS-21), and Flourishing Scale. Boarding students additionally completed the Utrecht Homesickness Scale. Thirteen boarding students described experiences of sleeping in boarding through focus groups.

Results: Boarding students, compared to day-students reported 40 minutes more sleep per weeknight ($p < .001$), with earlier sleep onset ($p = .026$), and later wake-up ($p = .008$) times. No significant differences were observed between boarding' and day-students' DASS-21 scores. Hierarchical regression revealed longer total weekday sleep time predicted higher psychological well-being in both boarding and day-students. Additionally, in boarding students, low homesickness-loneliness and homesickness-ruminations further predicted psychological well-being. Thematic analysis of boarding students' focus group responses revealed

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that night-time routine, and restricting technology use at night facilitated sleep.

Conclusions: This study supports – in both boarding and day-students – the importance of sleep for adolescent well-being. Sleep hygiene can play an important role in boarding student sleep, especially: regular night-time routine and restricting technology use at night. Finally, these findings suggest that poor sleep and homesickness have an adverse effect on boarding student psychological well-being. This study highlights the importance of strategies which promote sleep hygiene and minimize homesickness, in boarding school students.

KEYWORDS

adolescence, boarding, homesickness, psychological distress, school, sleep, technology

INTRODUCTION

Secondary boarding schools (residential high schools) serve regional and remote communities and provide access to educational resources that may not be available locally. An estimated 20,000 adolescents are thought to attend secondary boarding schools in Australia, 72,000 in the UK and 90,000 in the USA (National Center for Education Statistics, 2017; Stevens et al., 2019; Stokes & Dunsmore, 2019). The transition to boarding school involves separation from family and community and adjusting to a new environment (Bramston & Patrick, 2007). A particular challenge is sleep. Residential bedrooms/dormitories can be uncomfortable, unfamiliar, noisy and often shared. These factors in older students attending boarding college or university are associated with disrupted and shortened sleep (Gellis et al., 2014; Peltz & Rogge, 2016). By contrast, little is known about the sleep of secondary school boarding students, but the general consensus is that compared to day students, sleep is also more disrupted, but paradoxically may be longer (Hedin et al., 2020; Kalak et al., 2019; Mander & Lester, 2021; Oluka et al., 2019; Simpson et al., 2021). This literature remains to be extended to help better inform boarding home policies and counselling interventions (Sprajcer et al., 2021). In particular, more information is needed regarding which aspects of sleep are most disrupted, for example, the timing of sleep versus the frequency and duration of nocturnal awakenings. A further issue is that secondary school boarding students typically report greater psychological distress than day-student peers (Fisher et al., 1984, 1990; Lester & Mander, 2020; Rudrum et al., 2022; Wahab et al., 2013). Poor sleep is likely to play a contributing role but whether this is in addition to already well-established predictors of psychological distress such as gender (Campbell et al., 2021) and homesickness (Demetriou et al., 2021; Fisher et al., 1984, 1990; Stroebe et al., 2002; Thurber et al., 2007; Thurber & Walton, 2012) remains to be tested.

Adolescents make up the majority of school-aged boarding students. Notably, sleep undergoes developmental changes in adolescence typified by a shortening of sleep and a marked delay in timing (Hirshkowitz et al., 2015; Keyes et al., 2015). Adolescence is further characterized by increased academic and extracurricular activity (e.g. sport, employment, social activities and community events) which can compete with and, thereby, affect sleep timing and duration (Carskadon, 2011; Crowley et al., 2018; Lushington et al., 2015; Yeo et al., 2020). An additional and contemporary issue impacting the sleep of adolescents is the intrusion of portable small-screen devices into the bedroom (e.g. smartphones, eBooks, iPads, etc). Screen use at night can displace sleep and raise arousal and is associated with longer latencies to sleep onset and shorter sleep (Alonzo et al., 2021; Charamaman et al., 2021; Correa et al., 2022; Hale & Guan, 2015; Hysing et al., 2015). Furthermore, because they can be held close to

the face, screen light may also disrupt circadian timing and delay sleep (Tetsuo Harada et al., 2002). As recognized by secondary school boarding students themselves, digital device use at night is a barrier to sleep (Hedin et al., 2020; Paterson et al., 2019). Consistent with this understanding, limiting screen use at night is reported to improve sleep (Bartel et al., 2018, 2019; Bartel & Gradisar, 2017). While small screen devices and sleep have attracted considerable research interest in the general child population, it remains to be fully investigated in the boarding environment, where a unique combination exists of high peer contact, a highly structured environment and staff supervision.

In a non-systematic search, we identified ten studies which have explored the sleep of secondary school boarding students (Table 1). Three studies report that moving to later school start times results in longer sleep (Boergers et al., 2014; Chan et al., 2018; Owens et al., 2010). Two studies interviewed boarding school students and report that technology use at night and the dormitory environment were disruptive to sleep (Hedin et al., 2020; Simpson et al., 2021). A single study found that early and middle but not late adolescent boarding compared to day-students report a higher frequency of sleep problems but surprisingly longer sleep periods (Kalak et al., 2019). A further single study found that delaying dinner times improved sleep quality (Lehmann et al., 2022). A final single study reported that more than a half of the students at a Ugandan boarding school met clinical criteria for poor sleep quality with the highest frequency in boys (Oluka et al., 2019). In the only Australian study, Mander and Lester (2021) surveyed 168 students and found that 75% were dissatisfied with their sleep. Moreover, they report that poor sleep was associated with psychological distress and that boarding staff support was effective at reducing sleep problems. Despite this emerging literature, sleep remains an important, yet understudied feature of this unique student population where pastoral responsibilities extend beyond normal school hours.

A better understanding of sleep may also provide insight into the factors contributing to psychological well-being in boarding school students. Boarding is reported to promote social connectedness, life satisfaction, peer relationships and academic outcomes (Mander, Cohen, & Pooley, 2015; Mander, Lester, & Cross, 2015; Martin et al., 2014, 2016, 2021). By contrast, boarding is also associated with homesickness, conduct problems and mood/emotional problems (Fisher et al., 1984, 1990; Lester & Mander, 2020; Mander, Cohen, & Pooley, 2015; Mander, Lester, & Cross, 2015; Rudrum et al., 2022; Wahab et al., 2013). These issues are especially prevalent in adolescence which is a well-recognized period for the onset of depression (McGorry et al., 2007). Rural, Indigenous Australians and minority students are well-represented in Australian boarding houses, and these groups of students have a higher incidence of mood disorders (Macdonald et al., 2018; McCalman et al., 2020; Redman-MacLaren et al., 2017; Rudrum et al., 2022). Finally, and consistent with findings in the general population, adolescent females at boarding schools are more likely to report mood disorders (Rau et al., 2018; Yu, 2018) with loneliness proposed as a possible risk factor (Rudrum et al., 2022).

Given the well-reported association between sleep and mood in adolescents (Booth et al., 2020; Geoffroy et al., 2020; Short et al., 2020), it is not surprising that poor sleep is also associated with poor mood in secondary school boarding students (Boergers et al., 2014; Chan et al., 2018; Oluka et al., 2019; Owens et al., 2010). Of the various psychological issues faced by boarding school students, a prevalent problem is homesickness (Demetriou et al., 2021; Fisher et al., 1984, 1990). The prevalence of homesickness in secondary boarding school students varies with definition, but estimates of up to 70% have been reported with a higher frequency in new boarders, females, Indigenous students and in the first weeks of transition from home (Fisher et al., 1986, 1990; Mander, Cohen, & Pooley, 2015; Mander, Lester, & Cross, 2015; O'Bryan, 2021; Van Tilburg et al., 1996). Stroebe et al. (2002) have identified five components which contribute to homesickness: missing family, loneliness, missing friends, adjustment difficulties and ruminations about home. Homesickness can be considered as a normal reaction to being away from home (Van Tilburg et al., 1996), but if severe, can be a risk factor for mood disorders (Demetriou et al., 2021; Ferrara, 2020; Fisher et al., 1984, 1986; Mander, Cohen, & Pooley, 2015; Mander, Lester, & Cross, 2015; Stroebe et al., 2002; Thurber & Walton, 2012). In the general population homesickness is associated with poor sleep (Beschner et al., 2020), but the relationship in secondary school boarding students is relatively under-explored. In a study of first-year university boarding students, Biasi et al. (2018) report that the association between homesickness and sleep is mediated through psychological distress.

TABLE 1 Summary of literature examining sleep in boarding students.

Author	Sample and country	Aim and purpose	Sleep assessment	Sleep measure	Conclusion
Bocrgers et al. (2014)	197 boarding students United States	Moved school start time: 0800 to 0825 h	Questionnaire	Total Sleep Time	↑Total Sleep Time (423–445 min) & ↓Sleep = ↑Depressed Mood
Chan et al. (2018)	228 boarding students Hong Kong	Moved school start time: 0730 to 0830 h	Questionnaire	Total Sleep Time	↑Total Sleep Time (387–421 min) & ↓Sleep = ↑Psychological Distress
Clarisse et al. (2010)	17 boarding school students France	Psychosocial adaptation to boarding	Interview	Anecdotal	The boarding environment and group socialization leads to shared bedtime preferences and chronotype synchronicity
Hedin et al. (2020)	38 day-students & 7 boarding students Sweden	Identify facilitators and barriers to sleep	Interview	Anecdotal	A good night's sleep was associated with: (1) Striving for a sense of well-being, (2) Tiring yourself out and (3) Regulating electronic media availability
Kalak et al. (2019)	558 day-students & 1013 boarding students in Switzerland	Comparison of sleep and psychological functioning	Questionnaire	Insomnia Severity Index, Awakenings, Sleep onset latency, Total Sleep Time	Boarding school students compared to day-students: ↑More sleep complaints but ↑TSI (especially students with an evening chronotype and in late adolescents)
Lehmann et al. (2022)	12 boarding students France	The effect of dinner time on sleep (early [3.5 h] vs. late [1.5 h] dinner before bedtime)	Polysomnography Questionnaire	Subjective Sleep Quality, Sleep EEG Parameters	From night 1–3 of the intervention: Total Sleep Time was longer after later (439.3 vs. 455.4 min) than earlier (438.6 vs. 431.2 min) dinner times. Sleep Efficiency was higher after later (66.2 vs. 89.3%) than earlier (86.0 vs. 84.5%) dinner times. Wake After Sleep Onset Time was shorter after later (42.3 vs. 33.6 min) than earlier (39.6 vs. 58.6 min) dinner times. N3 Sleep was higher after later (197.5 vs. 207.5 min) than earlier (202.0 vs. 207.2 min) dinner times

TABLE 1 (Continued)

Author	Sample and country	Aim and purpose	Sleep assessment	Sleep measure	Conclusion
Mander and Lester (2021)	168 boarding students Australia	Perceptions of sleep	Questionnaire	Sleep/Wake Problem Scale	In the last week: 75% Sleep Dissatisfaction, 52% Daytime Sleepiness, 73% Nightmares/Bad Dreams, stayed up all night 86% & 65% Stay-up >0100 h. ↓Sleep Problems = ↑Psychological Distress, ↑Emotional Problems, ↑Conduct Problems, ↑Peer Problems, ↓Life Satisfaction & ↓Resilience. ↑Boarding Staff Support = ↓Sleep Problems
Oluka et al. (2019)	617 boarding students Uganda	Sleep influence on well-being in Ugandan students	Interview Questionnaire	Pittsburgh Sleep Quality Index	59% Poor Sleep Quality. ↑Stress, Light and Noise in the Sleep Environment = ↓Sleep Quality. ↓Sleep Quality = ↑Psychological Distress
Owens et al. (2010)	118 day-students & 83 boarding students United States	Moved school start time: 0800 to 0830 h	Questionnaire	Sleep onset time, Wake-up time, Total Sleep Time	↑Total Sleep Time (Boarding students = 428–471 min & Day-Students = 425–471 min)
Simpson et al. (2021)	5 ex-boarding students England	Long-term impacts of boarding	Interview	Anecdotal	Reported a greater number of sleep problems and problems sleeping in boarding dormitories compared to home

However, poor sleep can be both a symptom and a risk factor for psychological distress. Given the bi-directional relationship between sleep and psychological distress the reverse is also possible, such that the association between homesickness and psychological distress is mediated through sleep. There is emerging evidence in children that poor sleep may be a stronger predictor of psychological distress than psychological distress *per se* is for poor sleep (Alvaro et al., 2013; Franzen & Buysse, 2008). In sum, it is assumed but untested that poor sleep will contribute to psychological distress after controlling for other known confounds such as homesickness (Beschner et al., 2020) and gender (Rau et al., 2018; Yu, 2018).

In sum, the present study aims to compare the sleep of boarding school students and day-students and to examine the contribution of sleep to psychological well-being with a focus on the interaction between sleep and homesickness with mood.

METHOD

This study utilized a mixed-methods design. It included a survey of sleep and psychological well-being in both boarding and day-students and focus group interviews with boarding school students exploring sleep and adjustment to the boarding environment. Approval for the study was obtained from the school principal. The study was approved by the University of South Australia's Human Research Ethics Committee (#203753). This study overlaps with that by Reardon et al. (2023), which examined the relationship between technology use and sleep on school versus non-school nights in the day-students participating in the current study.

Questionnaire study

Participants

Boarding and day-students attending Years 7–12 were recruited to participate in the study from a single independent, co-educational school in Adelaide, South Australia. The initial contact with students was made at the school's weekly assembly followed by an information package disseminated through email to caregivers, and the school's newsletter to community stakeholders, parents and guardians. Of the total school population ($N=686$), 87.90% (602/686) participated in the study. Day-students lived with their families within driving distance of the school while boarding school students typically came from country families and mainly from rural and remote South Australia and the Northern Territory. While the school has international students, these students were not present during the study because of the COVID-19 pandemic and border closures. The school has a strong boarding history, spanning several decades and has specialist residential staff supervising boarding students before and after school.

Measures

Sleep

Sleep was assessed using the School Sleep Habits Survey (SSHS) which contains 56 questions assessing sleep timing, subjective quality of sleep, daily sleep routine and technology use before bed (Wolfson & Carskadon, 1998). A subset of the questions are reported in this study. Students were asked, 'During the most recent school week (Monday to Thursday) please estimate to the nearest 5 minutes and indicate AM or PM' their usual: (1) bedtime, (2) lights out time, (3) sleep onset time, (4) wake-up time, (5) number of night-time awakenings and (6) time spent awake at night. These parameters were used to estimate total sleep time. Sunday and Friday nights were excluded from the definition of weekday sleep as they are not typically reflective of habitual school day sleep (Olds et al., 2010). Additional sleep environment questions included: 'When I go to bed at night, I feel?' (1 = very safe, 5 = very unsafe); 'On

a typical school night (Monday to Thursday), how many minutes would you spend on social media or text messaging in bed, while waiting for sleep?'; 'Typically, how often do you think you get enough sleep on weekdays?' (1 = always, 5 = never); and 'Having my phone or laptop with me in bed' (1 = makes it much easier to get to sleep, 5 = makes it much harder for me to get to sleep; Sleep disruption due to technology use). Students were also asked about chronotype: 'One hears about 'morning people' and 'evening people'. Which one of these types of people do you consider yourself to be?' (1 = Definitely an evening type, 5 = Definitely a morning type) and, in addition, boarding students were asked: 'Compared to sleeping at home, to get to sleep in boarding it is?' (1 = significantly easier, 5 significantly harder). The sleep timing estimate from the SSSHs are reported to correlate well with actigraphy and sleep diary estimates in adolescent populations (Short et al., 2013; Wolfson et al., 2003). The SSSHs has been used in previous boarding studies (Boergers et al., 2014).

Mental health

Psychological distress was assessed using the 21-item Depression Anxiety Stress Scale-21 (DASS-21). The DASS-21 asks participants using a four-point scale (0 = *not at all*, 3 = *most of the time*) to rate the frequency of psychological problems in the previous week (e.g. 'I found it difficult to work up the initiative to do things') and generates three mood subscales (depression, anxiety and stress) and an overall distress score (Lovibond & Lovibond, 1996). The instrument has been validated for use in Australian populations (Lovibond & Lovibond, 1996) and used in boarding students (Mander & Lester, 2017; Mellor et al., 2015; Wahab et al., 2013). Higher scores indicate higher distress. The DASS-21 is reported to demonstrate good internal and external reliability (Henry & Crawford, 2005). In the current study, Cronbach alphas for the depression, anxiety and stress scales were .92, .85 and .87, respectively, with an overall reliability of .95 for the total score.

The Flourishing Scale (FS) is an eight-item measure of well-being (Diener et al., 2009). Participants are asked how strongly they agree with statements (e.g. 'I lead a purposeful and meaningful life') rated on a seven-point scale (1 = *strongly disagree*, 7 = *strongly agree*) which is used to generate a total score. Higher scores indicate higher flourishing. The FS has been validated in diverse adolescent subgroups (Hone et al., 2013; Romano et al., 2020). The Cronbach alpha for the FS was .93.

Homesickness

Homesickness was assessed using the 20-item Utrecht Homesickness Scale (UHS; Stroebe et al., 2002; van Vliet et al., 1998). It asks participants in the previous 4 weeks how strongly they agree with statements rated on a five-point scale (1 = *not at all*, 5 = *very strong*). The UHS generates five subscales (missing family, loneliness, missing friends, adjustment difficulties and ruminations about home) and a total homesickness score. Higher scores indicate greater homesickness. The UHS has been validated in Australian students (Watt & Badger, 2009). The Cronbach alpha for the total UHS score was .96; and the alphas for the subscales were: Missing family = .94, Loneliness = .83, Missing friends = .87, Adjustment difficulties = .91, and Ruminations about home = .91.

Procedure

The questionnaires were administered during class time under the supervision of teachers and completed online using the REDCap system (Harris et al., 2019). The study was conducted in the second week of term two. Participating students entered a draw to win a \$50 cash prize.

Questionnaire data analysis

The statistical package for the social sciences (SPSS v26) was used to analyse data. The data were checked for outliers, cleaned, screened for normality, assessed for group homogeneity and tested for

violations of Levene's assumption. Two-way between factor analysis of variance tests (ANOVA) were used to examine the effect of gender and year level on homesickness scores. Three-way between factor ANOVAs was used to examine the effects of boarding status, gender and year level on psychological well-being, sleep and the use of small screen devices in the bedroom. Hierarchical regressions were used to examine the relationship between variables of interest and mood (total DASS-21 score). In day-students, gender and year level (Step 1) and total sleep time (Step 2) were entered as independent variables. In boarding students, gender, years in boarding and year level (in Step 1), homesickness (Step 2) and total sleep time (Step 3) were entered as independent variables.

Focus groups

Participants

The focus groups were designed in collaboration with the Director of Boarding and staff to allow an opportunity for researchers to listen to boarding students' own unique experiences (Kitzinger, 1994). Thirteen boarding students, representative of the extracurricular, leadership and academic roles at the school participated in two focus groups: six students attending years 7–10 (four females) and seven attending years 11–12 (three females). The students were selected using purposive sampling.

Procedure

Both parents and students were given information pertaining to the study, and students gave written informed consent at the beginning of the focus group. A semi-structured interview approach was followed. Students were asked to share their experience of routine (a summary of which has been described in Table 2, for readers unfamiliar with boarding school) and sleeping in boarding using the following questions: (1) *How does sleeping in boarding compare with sleeping at home?*, (2) *What challenges do you have with sleeping in boarding?* and (3) *What strategies have you used to assist in achieving satisfying sleep?*. The focus groups lasted approximately 45 minutes and were audio-recorded and transcribed verbatim. The focus group participants were entered into a draw for a \$50 cash prize.

Qualitative data analysis

Data were transcribed from audio-recordings by the first author, permitting for extensive familiarization with the data. A recursive, iterative approach was taken to the data analysis, whereby the research team sought to interpret participants' experiences through a reflexive process mindful of our subjective positioning as researchers (Alvesson & Sköldbörg, 2009). This was both in relation to participants and to each other and in acknowledgement of Braun and Clarke's (2021a: 330) emphasis on 'the researcher's subjectivity as analytic *resource*, and their reflexive engagement with theory, data and interpretation'. In line with this approach, the process of analysis was loosely held and open to ongoing revision in light of participants' responses and researchers' emergent understandings. The participants had the opportunity to review transcripts to ensure that the interpretive process reflected their understanding of the experiences reported (Kitzinger, 1994). Similarly, participants' responses to the first focus group were used to inform the probes used in the second focus group. The research team was constituted mindful of participant ages, psychological issues covered and the institutional and socio-cultural context of the school and its students. The team combined extensive experience and expertise in administering and providing pastoral care for boarding school students (AJ and AR) and both clinical and research expertise in sleep and psychological well-being in children (AA, AR and KL). The team met regularly through the process of analysis to explore each other's interpretations, drawing on their respective expertise, experience and emerging understandings of participants' experiences.

TABLE 2 Weekday routine for boarding students.

Time	Activity
07:00	Students begin waking and having breakfast
08:45	School begins
15:30	School ends, and twice-weekly sport begins
17:00	Sport ends
18:00	Dinner
18:30	Supervised study begins (all students)
20:00	Supervised study ends (Year 7–10)
20:30	Supervised study ends (Year 11–12) and social activities scheduled (e.g. basketball, gym and board games)
21:30	Lights-out for Year 7
21:45	Lights-out for Years 8–9
22:00	Lights-out for Year 10
22:30	Lights-out for Year 11–12

Note: Boarding students in Years 7–10 share a room with one other student, while Year 11–12 students have their own room.

This reflexive process sought to acknowledge the positionality of researchers and participants with respect to each other in informing the ongoing interpretation of the data. Coding was inductive in line with the process outlined above and informed by the steps recommended by Braun and Clarke (2021b). Participants responses were evaluated and assigned initial codes, and re-coded as appropriate: codes were tentatively assigned using descriptive, semantic coding; then the team searched and collated these codes, grouping them by themes. Themes were progressively reviewed and assessed for intensity, frequency, specificity and level of agreement as recommended by Tiggemann et al. (2000). Then themes were defined and named, and the resulting findings counterpointed with the findings from the quantitative analyses (Creswell, 2008). Finally, the process was audited by an experienced qualitative researcher with expertise in reflexive methodologies (JC).

RESULTS

Questionnaire findings

From 602 initial responses, 17 students did not continue past initial demographic questions. Due to the small number of boarding students the questionnaire responses for students in Years 7–9 were excluded from the questionnaire analyses (boarding students = 10, day-student = 261). As well, due to small numbers of responses five students who selected ‘other’ or ‘prefer not to disclose’ their gender identity were excluded from analyses. As such, gender analyses were restricted to a comparison of those students who identified as either male or female. The final sample included 309 students consisting of 59 boarding students (Year 10 = 10M & 12F, Year 11 = 6M & 14F and Year 12 = 9M & 8F) and 250 day-students (Year 10 = 47M & 42F, Year 11 = 49M & 60F and Year 12 = 27M & 25F). Nine boarding students and three day-students self-identified as Aboriginal or Torres Strait Islander young people. No significant difference was observed in the gender distribution between boarding students (34F and 25M) and day-students (127F and 123M; $\chi^2 = .89, p > .05, df = 1$).

Sleep

Apart from one exception, the three-way ANOVA analyses revealed no significant gender (male vs. female) or year level (year 10 vs. 11 vs. 12) differences in any of the sleep variables and likewise,

technology use variables. The one exception was the variable feeling safe-in-bed, where no significant main effect was observed for year level and no significant year level by gender interaction, but a significant main effect was observed for gender, with males reporting feeling safer ($1.81 \pm .87$) than females ($2.02 \pm .88$), $F(1, 284) = 4.12, p < .05$. Accordingly for the sake of brevity when reporting sleep results, the ANOVA tests examining sleep variables were repeated but with the sample collapsed across gender (with gender diverse excluded) and year level. The subsequent One-Way ANOVA tests with boarding status as the only between-group factor revealed that boarding compared to day-students had significantly earlier sleep onset (22:50 vs. 23:10 h) and later wake up times (07:16 vs. 06:56 h) and, consequently, longer total sleep times (506 vs. 465 min). In addition, they were significantly more likely to report obtaining enough sleep on school nights but unexpectedly they also reported feeling less safe-in-bed (all $p < .05$; Table 3).

Sleeping at the boarding school compared to home was reported by 4.8% of boarding students to be significantly easier, 9.5% somewhat easier, 33.3% not any different, 42.9% somewhat harder and 9.5% significantly harder.

Psychological distress

The mean \pm DASS-21 and FS values are reported in Table 4. ANOVA results are reported in Table 5. A significant main effect of year level on DASS-21 stress scores was observed with LSD post-hoc testing revealing that Year 10 (5.63 ± 4.35) < Year 11 (7.08 ± 4.82) < Year 12 (7.60 ± 5.13 ; all $p < .05$). A significant main effect was also observed for gender on DASS-21 stress (males = 5.49 ± 4.92 < females = 7.75 ± 4.41), anxiety (4.14 ± 4.49 < 6.04 ± 4.59) and total (14.88 ± 13.34 < 20.83 ± 17.68) scores. No significant year level by gender interaction effects for psychological distress were observed (all $p > .05$).

Homesickness

The mean UHS values are reported in Table 6. Due to small cell sizes, the effect of gender and likewise year levels, on homesickness were separately examined using one-way ANOVA tests. The gender one-way

TABLE 3 Means \pm SD sleep values for boarding school students and day-students and *F*-values (effect sizes) from ANOVA analysis (significant results are bolded).

School night sleep	Boarding students ($n = 53$)	Day-students ($n = 228$)	<i>F</i> -value (degrees of freedom) (effect size); <i>p</i> -value
Bedtime (h:min \pm min)	22:08 \pm 36	22:13 \pm 82	.23 (<i>f</i> , 269) (.001); .633
Lights out time (h:min \pm min)	22:08 \pm 38	22:21 \pm 67	2.90 (<i>f</i> , 267) (.001); .088
Sleep onset time (h:min \pm min)	22:50 \pm 41	23:10 \pm 72	5.03 (1, 268) (.018); .026
Wake after sleep onset (h:min \pm min)	7.2 \pm 7.3	8.7 \pm 7.9	.64 (<i>f</i> , 55) (.011); .639
Final wake-up time (h:min \pm min)	07:16 \pm 25	06:56 \pm 40	7.05 (1, 265) (.026); .008
Total sleep time (min)	506 \pm 42	465 \pm 72	14.75 (1, 264) (.053); <.001
Sleep onset latency (min)	43.7 \pm 35.4	57.64 \pm 82.0	1.23 (<i>f</i> , 262) (.005); .269
Media/texting at bedtime (min)	39.8 \pm 49.7	44.2 \pm 75.8	.38 (<i>f</i> , 265) (.001); .537
Sleep disruption due to phone/laptop use ^A	2.81 \pm 1.08	3.21 \pm .96	5.40 (1, 274) (.019); .021
How often do you think you get enough sleep on school nights? ^A	2.17 \pm .83	2.60 \pm 1.04	7.56 (1, 282) (.026) .006
Feeling safe-in-bed at night ^A	2.15 \pm .87	1.87 \pm .87	4.59 (1, 284) (.016) .033
Chronotype ^B	3.77 \pm 1.07	3.64 \pm 1.13	.66 (<i>f</i> , 284) (.002); .420

Note: ^ADenotes scored on a 5-pt scale with higher scores indicating more impaired. ^BScored on a 5-pt scale with lower scores indicating morning type and higher scores evening chronotype. Effect sizes (partial eta squared): .1 = low, .06 = medium and .14 = large.

TABLE 4 Means ± SD psychological distress values.

Psychological distress	Boarding students (n = 50)						Day-students (n = 214)					
	Year 10		Year 11		Year 12		Year 10		Year 11		Year 12	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
DASS-21	(n = 9)	(n = 12)	(n = 5)	(n = 12)	(n = 5)	(n = 7)	(n = 36)	(n = 34)	(n = 46)	(n = 55)	(n = 23)	(n = 20)
Total Score	9.22 ± 8.26	18.75 ± 12.05	20.80 ± 12.70	14.92 ± 10.52	15.80 ± 12.79	25.86 ± 13.61	12.76 ± 13.84	18.53 ± 12.25	16.17 ± 14.23	20.55 ± 12.66	16.43 ± 12.54	24.40 ± 15.19
Depression	4.00 ± 4.00	6.08 ± 4.72	7.80 ± 4.76	4.92 ± 4.6	6.20 ± 5.54	8.14 ± 5.4	4.35 ± 4.96	6.29 ± 5.33	5.57 ± 5.30	6.02 ± 4.88	6.00 ± 5.03	8.10 ± 6.50
Anxiety	2.33 ± 1.73	6.42 ± 4.25	4.40 ± 3.97	4.17 ± 3.33	4.40 ± 3.78	6.86 ± 5.27	3.84 ± 4.80	5.12 ± 4.35	4.52 ± 4.68	6.47 ± 4.65	4.48 ± 4.75	7.00 ± 5.37
Stress	2.89 ± 2.89	6.25 ± 4.33	8.60 ± 6.60	5.83 ± 6.66	5.20 ± 4.02	9.86 ± 5.34	4.69 ± 4.80	7.12 ± 5.67	6.09 ± 5.08	8.05 ± 4.53	5.96 ± 4.97	9.30 ± 4.90
Flourishing Scale	(n = 9)	(n = 9)	(n = 4)	(n = 10)	(n = 3)	(n = 7)	(n = 36)	(n = 33)	(n = 44)	(n = 54)	(n = 23)	(n = 20)
	4.96 ± 1.79	5.96 ± 1.20	4.38 ± 1.83	5.46 ± 1.12	5.79 ± .38	4.93 ± .86	5.31 ± 1.14	5.18 ± 1.15	5.02 ± 1.24	5.48 ± 1.06	4.92 ± 1.13	4.91 ± 1.26

TABLE 5 Psychological distress: *F*-values (effect size) and *p*-values from ANOVA analyses (significant results are bolded).

Psychological distress	Boarder status	Year level	Gender	Boarder status by gender	Year level by gender	Boarder status by year level	Boarder status by gender by year level
DASS-21	<i>df</i> =1, 253	<i>df</i> =2, 253	<i>df</i> =1, 253	<i>df</i> =1, 253	<i>df</i> =2, 252	<i>df</i> =2, 252	<i>df</i> =2, 253
Total	.12 (.773); <.001	2.26; (.018); .106	5.50; (.021); .020	.17; (.001); .681	1.86; (.014); .158	.05; (<.001); .95	1.06; (.008); .348
Depression	.03; (<.001); .875	1.65; (.013); .194	1.18; (.005); .278	.49; (.002); .518;	1.60; (.013); .198	.09; (.001); .910	.45; (.004); .642
Anxiety	.39; (.002); .535	.88; (.007); .415	6.90; (.027); .009	.02; (<.001); .904	.62; (.005); .541	.24; (.002); .784	1.06; (.008); .349
Stress	.31; (.001); .578	3.86; (.030); .022	7.85; (.030); .005	.29; (.001); .660	2.84; (.022); .061;	.42; (.003); .593	1.65; (.013); .194
Flourishing Scale	<i>df</i> =1, 240	<i>df</i> =2, 240	<i>df</i> =1, 240	<i>df</i> =1, 240	<i>df</i> =2, 240	<i>df</i> =2, 240	<i>df</i> =2, 240
	.09; (<.001); .762	.38; (.003); .375	.94; (.004); .942	.24; (.001); .625	2.19; (.018); .114	.93; (.008); .395	1.31; (.011); .271

Note: Effect sizes (partial eta squared): .1 = low, .06 = medium and .14 = large. *df* denotes degrees of freedom.

TABLE 6 Mean \pm SD homesickness values ($n = 41$ boarding school students).

Utrecht homesickness scale	Year 10		Year 11		Year 12	
	Males ($n=9$)	Females ($n=9$)	Males ($n=4$)	Females ($n=10$)	Males ($n=3$)	Females ($n=6$)
Total	41.78 \pm 20.36	64.0 \pm 20.89	41.75 \pm 15.50	63.50 \pm 21.25	45.00 \pm 26.21	67.00 \pm 12.51
Missing family	9.89 \pm 5.11	15.22 \pm 5.21	9.00 \pm 3.83	16.10 \pm 5.65	9.00 \pm 2.00	15.33 \pm 5.47
Loneliness	6.78 \pm 3.60	10.00 \pm 3.50	7.75 \pm 4.50	9.30 \pm 5.29	8.67 \pm 8.08	13.83 \pm 4.58
Missing friends	8.56 \pm 4.90	13.00 \pm 5.15	8.75 \pm 2.22	12.50 \pm 4.97	9.33 \pm 6.11	13.50 \pm 3.83
Adjustment difficulties	9.11 \pm 5.44	12.67 \pm 3.64	6.50 \pm 1.91	12.20 \pm 4.73	9.00 \pm 5.00	12.00 \pm 3.95
Ruminations about home	7.44 \pm 3.71	13.11 \pm 6.55	9.75 \pm 6.13	13.04 \pm 6.67	9.00 \pm 7.00	12.33 \pm 3.39

ANOVA analyses revealed that females reported significantly higher scores for total homesickness, mean \pm *SD* females versus males = 64.52 ± 18.69 versus 42.37 ± 19.04 : $F(1, 39) = 13.50, p = .001, \eta^2 = .257$, adjustment difficulties, 12.32 ± 4.02 versus 8.44 ± 4.60 : $F(1,39) = 8.13, p = .007, \eta^2 = .173$, missing family, 15.60 ± 5.24 versus 9.50 ± 4.19 : $F(1,39) = 15.36, p = .001, \eta^2 = .283$, missing friends, 12.92 ± 4.62 versus 8.75 ± 4.34 : $F(1,39) = 8.32, p = .006, \eta^2 = .176$, ruminations about home, 13.04 ± 5.79 versus 8.31 ± 4.74 : $F(1,39) = 7.44, p = .009, \eta^2 = .160$ and loneliness, 10.64 ± 4.73 versus 7.37 ± 4.50 : $F(1, 39) = 4.82, p = .034, \eta^2 = .110$. One-way ANOVA analyses revealed no significant main effect for year level on any homesickness variable (all $p > .05$).

Hierarchical regression

In boarding students, preliminary Pearson-*r* correlational analyses revealed only a single significant relationship between homesickness subscale scores and total sleep time, Missing Family $r(40) = .34, p < .05$; remainder of correlations $r(40) < .27, p > .05$. The hierarchical regression analyses with demographic, homesickness subscales and total sleep time as predictor variables and Total DASS-21 score as the dependent variable was significant, $F(9, 40) = 9.25, p < .001$ with the model explaining 72.9% of the variance (adjusted 65.0%). Two of the homesickness scales, Ruminating about Home and Loneliness, together with total sleep time emerging as significant predictors (Table 7).

TABLE 7 Hierarchical regression results with Total DASS-21 as the dependent variable.

Variable	<i>B</i>	<i>SE B</i>	β	<i>R</i> ²	ΔR^2	Adjusted <i>R</i> ²
Boarding students (<i>n</i> = 41)						
Step 1				.074	.074	-.001
Constant	-.53	37.80				
Year level	.60	3.70	.03			
Gender	5.32	4.22	.20			
Years in boarding School	1.73	2.31	.16			
Step 2				.650	.575***	.562
Constant	23.83	25.74				
Adjustment difficulty	.168	.581	.058			
Missing family	-.517	.429	-.220			
Missing friends	-.173	.642	-.064			
Ruminating about home	.915	.422	.401**			
Loneliness	1.768	.440	.645***			
Step 3				.729	.079**	.650
Constant	75.85	28.79				
Total sleep time	-.067	.022	-.352**			
Day-students (<i>n</i> = 214)						
Step 1				.057	.057***	.048
Constant	-14.97	13.91				
Year level	2.259	1.258	.122			
Gender	5.523	1.853	.203			
Step 2				.213	.156***	.201
Constant	34.14	14.92				
Total sleep time	-.075	.012	-.401***			

Note: * $p < .05$, ** $p < .01$ and *** $p < .001$.

In day-students, the hierarchical regression analyses with demographics and total sleep time as predictors and Total DASS-21 score as the dependent variable was significant, $F(3, 206) = 18.28, p < .001$ with the model explaining 21.3% (adjusted 20.1%) of the variance and only total sleep time emerging as a significant predictor (Table 7).

Focus group findings

Thematic analysis of focus group responses revealed three themes relating to sleep and boarding: the boarding environment, rules and routine and homesickness (see Table 8 with illustrative quotes). Overall, the boarding environment was described by boarding students as amenable to sleep. Sleep in the home compared to the city boarding environment was reported to be very different for many students, but of the two the boarding environment was seen as the more conducive. Other than noise, notably no issues were raised regarding the bedroom environment itself (e.g. bedding, etc.). Moreover, the practice of younger boarding students sharing a bedroom was viewed positively as a countermeasure to homesickness and promoting friendships. Students reported that boarding was characterized by rules and routine and having regular bedtimes and waketimes which facilitated sleep. However, the need for flexibility was raised. This was to accommodate individual differences and to allow 'catch up' sleep especially when the sleep routine was disrupted by extracurricular activities. As a corollary, weekend naps were reported as a common countermeasure to sleepiness. Boarding students highlighted that a major contributor to good sleep was the prohibition of small screen devices at night (e.g. mobile phones). They further noted that rules around technology use at night were typically not in place at home and recognized that this had an adverse effect on their sleep quality at home. Homesickness and its effect on sleep was also noted. Poor sleep was especially prevalent during the home to school transition but was not viewed as a major issue.

DISCUSSION

The main finding of the present study is that boarding compared to day-students slept 40 minutes more on school nights which was mostly explained by earlier sleep onset times. Boarding students were also less likely to have digital devices in the bedroom which may explain the lower frequency of disrupted sleep due to computer/phone use. The school policies endorsing a fixed bedtime routine and limiting technology use at night were viewed as positive by boarding students in the focus groups. They also identified academic demands as a potential stressor affecting sleep and the importance of a conducive physical environment for sleep. Despite expectations, boarding and day-students reported similar levels of psychological distress. Nevertheless, poor sleep was found to be an independent risk factor for psychological distress in both boarding and day-students. Homesickness was also found to be strong predictors of psychological distress in boarding students, but only the dimensions of ruminating about home and loneliness. Focus group participants identified homesickness as contributing towards poor sleep, especially in the first few weeks of school and suggested that social connectivity is as important strategy for minimizing homesickness.

Studies reporting sleep findings in secondary school boarding students are limited. Typically, sleep has been a secondary focus (Boergers et al., 2014; Chan et al., 2018; Clarisse et al., 2010; Owens et al., 2010; Simpson et al., 2021) with only a limited pool directly examining sleep (Hedin et al., 2020; Kalak et al., 2019; Lehmann et al., 2022; Mander & Lester, 2021; Oluka et al., 2019). Of the studies which have directly examined sleep, only Kalak et al. (2019) have compared boarding with day-students. The present study adds to this literature. Consistent with Kalak and colleagues we also found that sleep duration was longer in boarding students. Paradoxically and despite extra sleep, Kalak et al. (2019) also report that boarding students had more sleep problems than their day-student peers. The frequency of sleep problems such as parasomnias and problems with sleep initiation and maintenance were not

TABLE 8 Thematic analysis of 13 participants' contribution to focus groups.

Theme and sub-themes	Example quote (participant ID, year level and gender)
The boarding environment	
<i>The physical environment</i>	
Overall, the physical boarding environment is well-suited to sleep, with comfortable beds, clean sheets and security. Very remote students, mainly from outback stations, report disrupting sounds and lights in the city environment, whereas students from towns or with big families are more comfortable with the sensory environment	<p>“It was really different to what I was used to, the sounds at night, the smells, and just the bed and the room, and the people I was with, it didn't feel right, and umm, I think I knew it would take a while to get used. It doesn't really affect my sleep so much getting back from weekends or exeats.” #3 (7, F)</p> <p>“I find the opposite, at home it is really loud and everything... (compared to sleep in boarding)” #4 (10, F)</p>
<i>Peers</i>	
Room-mates are vital to individuals overcoming homesickness and the initial anxieties of moving into boarding; however, as students age, separate rooms are preferred, as they allow for ones' own space, away from social interaction, and permitting autonomy over completion of study and an earlier bedtime when required. The selection of room-mate is vitally important	<p>“Yeah, and a lot of boarders come in Year 10, and I think that it is especially important that they have those connections early, and then in Year 11 and Year 12, you can settle a little more, and focus on your studies with your own room.” #8 (12, M)</p> <p>“Sometimes it is good having a roommate, if they are more responsible than you, sort of a role model for you as well.” #5 (10, F)</p> <p>“The cons of it could be that you could get a bit distracted from talking that much to your roommate that you waste time... rather than getting to sleep you're talking.” #2 (7, M)</p>
<i>Academic workload</i>	
Academic expectations, upcoming assessments, deadlines and tasks are a cause of stress for boarders, which they implicate in decreasing their sleep quality and quantity	<p>“...sometimes you have big blocks where you have lots (of school work), and you want to be studying for extra, or whatever, and at other times, you don't have a lot at all.” #12 (11, M)</p> <p>“Yeah, I definitely, stressed about my school work, a little bit more than a lot of my friends, and ummm, I kind of don't talk to anyone about it. So sometimes it affects my sleep, but not too bad.” #3 (7, F)</p>
<i>Additional workload</i>	
Extracurricular activities, often early in the morning or into the night, disrupt the boarding routine, displace relaxation and study time, and are a cause of fatigue, lost sleep and concern. Contrastingly, engaging in exercise was reported as improving sleep also. Naps are often used as a countermeasure on weekends	<p>“Yeah, it would be good if you could have a night where you could go to bed early during the week, because on the weekend for me, that's when I have got all my early mornings, like I have got early morning trainings in the week, but then Saturday is netball, Sunday is footy, so you don't really get to have a sleep in on the weekend.” #4 (10, F)</p> <p>“Sometimes there are just nights where you can't avoid having a shorter sleep. Like I know I was playing (sport) late Friday nights and ... early Saturday morning, and getting like 6 hours, 7 hours max. And then I would just sleep during the (afternoon) the next day. And so, like you can have shorter sleeps, but you do have to make up for it somewhere” #13 (12, F)</p>
<i>Staffing</i>	
Consistent staffing and expectations, particularly around lights-out, technology use and morning wake up were identified by students as vital to good sleeping patterns	<p>“...some them are a bit more, let a bit more slide, and some are a bit more down the line.” #4 (10, F)</p> <p>“Some are really strict, and some are a bit more...” #3 (7, F)</p> <p>“Yeah, it's a bit like roulette, you never know what you are going to get...” #5 (10, F)</p>
Rules and routine	
<i>Benefits – Routine</i>	

TABLE 8 (Continued)

Theme and sub-themes	Example quote (participant ID, year level and gender)
<p>Participants highlighted the positive effects of boarding routine on their sleep. Boarding is a very structured environment, with set time for sport, dinner, study, and socializing and strict lights-out and wake up times. While it takes time to 'settle in', and get used to boarding, the daily routine comes to aid sleep attainment</p>	<p>"Yeah... I think once you create your own routine, and settle in, it becomes much easier to fall asleep, and you know when you are getting up and stuff, like that, it just becomes much easier." #8 (12, M)</p> <p>"It was at the start, but now I am in the routine, it is just easier to get up I think." #5 (10, F)</p> <p>"Yeah... basically, yep, it just becomes routine." #7 (12, M)</p> <p>"...you get used to the routine... sport after school, dinner, study, have a little bit of fun, then bed. I mean, I think, most of the (students) become accustomed to it, and that's becomes their daily routine." #8 (12, M)</p>
<p><i>Barriers – Rigidity</i></p> <p>While routine and structure have a positive impact on sleep, there is also a need to differentiate for individual preferences and needs. Some students have different schedules, need more sleep or need to be able to catch up after missing sleep. This is not always possible in a highly standardized environment, and depending on boarders' upbringing, they may have different preferences with regard to routine, environment and sleep generally</p>	<p>"With some boarders, it would be better to have an individualised plan because yeah, some people just need, some people are different, and everyone is in a different situation..." #8 (12, M)</p> <p>"Give boarders the option some nights to do a bit of study before dinner, so then they can have that time off after, I don't know if it would be too hard to monitor, but then they can maybe get an earlier sleep." #11 (11, M)</p>
<p><i>Technology policies</i></p> <p>A strength outlined by boarders was the technology policy. Students felt empowered by staff, in that phones were not 'collected', however, felt that the rules around placement of technology at night—in kitchens or on study desks, promoted improved sleep, and reduced disruption and fatigue. Students did not always like this, and would feel they were missing out in contrast to day-students, but agreed that it improved their well-being. When students went home, they would revert to technology use, and despite liking the rules, would not voluntarily opt to put phones if unmonitored. The importance of routine and rules around technology are clear responses of the participants</p>	<p>"I think it is good, because like I know previously, I would get distracted by my phone, and like I am getting a lot more sleep." #10 (12, F)</p> <p>"I like that rule through, putting your phone up just because it's easy to get to sleep like that whereas back at home I never have to put my phone up so just stay on it really late and don't have, don't get much sleep...it is all so hard to put your phone up because you're so sucked into the social media and stuff, you just don't want to put it up, you're like, one more Snapchat, or one more text message or something." #5 (10, F)</p> <p>"In an ideal world, if you take away that mobile distraction for like the hour before and after bed (implement stricter rules), that would be a great thing" #1 (10, F)</p>
<p>Homesickness</p>	
<p><i>Initial challenges</i></p> <p>Especially in the first few weeks of boarding, and after holidays, homesickness is a significant problem for boarding school students and impacts sleep</p>	<p>"When I first (arrived at boarding), I would wake up randomly, and then it wasn't like you wake up and feel confused, but now that I have been here for a couple years, it's the same as being at home really. That's about it, yeah." #7 (12, M)</p>
<p><i>Overcoming homesickness</i></p> <p>Overcoming homesickness is achieved through social interaction, immersion in activities, routine and being busy</p>	<p>"When I just started, it was better me being busy, because it, I didn't need to think about homesickness, and think about home, and that, about what is going on in the present." #2 (7, M)</p>

collected in the present study. Notably, when comparing sleep length to those reported in other studies, students in the present study slept longer than US and Hong Kong peers (Chan et al., 2018; Owens et al., 2010). This can be attributed to different school start times and possible differences in school routines (e.g. time devoted to homework and extra-curricular activities; Sprajcer et al., 2021). Nonetheless, the boarding students in the present study had sleep lengths closer to recommended norms for adolescents which are rarely achieved by most adolescents on school nights (Hirshkowitz et al., 2015).

Analysis of the focus group response suggests the extra sleep obtained by boarding students can be partly attributed to the presence of a regular bedtime routine and prohibiting technology use after bedtime. A routine that is stable and permits adequate sleep is known to be important for child sleep (Hall & Nethery, 2019). Boarding is a very structured environment, with set time for sport, dinner, study, and socializing and strict lights-out and wake-up times. While it takes time to 'settle in', and get used to boarding, the daily routine can aid sleep hygiene and promote sleep. Having a bedtime that permits at least 9–10h of sleep can further ensure sleep needs are met. Nevertheless, focus group participants noted because the boarding environment is highly standardized and individual needs are not well accommodated that tailored sleep schedules may be appropriate for some students.

Hedin et al. (2020) interviewed boarding students and like the present study also identified technology use at night as a barrier to sleep. This is consistent with most systematic reviews and meta-analyses examining small screen use at night in children (Carter et al., 2016; Hale & Guan, 2015). The boarding students in the focus group interviews supported the restriction of technology use at night as a positive for sleep and also reported that the no technology use policy was a useful safety net. The policy of the school in the present study is that students need to place their small screen devices prior to bedtime either in a dedicated kitchen area or away on a study desk. Boarding students reported that because they were responsible for securing devices rather than having them collected by staff that this was empowering. In addition, while they felt they were missing out in contrast to day-students they recognized the value of not having small screen devices in the bedroom and having policies in place which precluded their use. By contrast, they reported such policies were often not present at home with consequent negative effects on sleep. It is suggested that regulating technology use is effective not necessarily because it minimizes use at bedtime but because it minimizes technology use later in the night and therefore prevents sleep fragmentation. Both sleep restriction and fragmentation are known to impair memory and daytime functioning (Jones & Harrison, 2001). US data collected in 2015 revealed that 70% of adolescents had sent text messages on their smartphone between 10pm and 6am (Troxel et al., 2015), 2015 data collected in Italy revealed that 50% of adolescents had used their phones to text after 2100h (Bruni et al., 2015) while Australian data indicate that the 70% of adolescent males and 83% of adolescent females received or sent a text messages/phone call between the hours of 10PM and 6AM at least once per week (Correa et al., 2022). We did not collect detailed information on technology use after bedtime such as the timing of activity and the nature of interactions and the impact on sleep. This warrants further investigation.

Unlike previous studies which report that psychological distress is higher in boarding students (Lester & Mander, 2020), boarding students in the present study reported similar levels of stress, anxiety, depression and flourishing to their day-student peers. We note that most studies examining psychological well-being in boarding students have focused on new students transitioning to boarding which may explain the lack of significant differences (Fisher et al., 1984; Guenther et al., 2020; Lester & Mander, 2020; Mander & Hasking, 2020). The Year 10–12 students whose questionnaire results are reported in the present study were experienced boarding school students (one or more years) and, moreover, had a term to settle-in before completing the survey. It is also possible that the boarding environment has changed from the harsh environment described by Schaverien (2011) and thus the relevance of earlier findings concerning psychological well-being (Evans-Campbell et al., 2012; Martin et al., 2014). Current participants described boarding as a safe, supportive and caring environment. Despite these positives, we note that questionnaire responses indicated that boarding school students reported feeling less safe at night than day-student peers.

Sleep is known to promote well-being (Alvaro et al., 2013; Franzen & Buysse, 2008; Scott et al., 2021). Consistent with this literature, longer sleep was associated with both boarding and day-students with lower psychological distress. Despite this association, it is acknowledged that the gains in sleep at a group level did not translate into lower levels of psychological distress in boarding compared to day-student peers. An explanation for this inconsistency is unclear, but a possible explanation is that any benefits to psychological well-being from extended sleep may have been offset by the additional psychological challenges faced by boarding students, such as homesickness.

A particular focus of the present study was homesickness. Homesickness is a recognized issue in boarding students and has been linked to the development of mood disorders (Fisher et al., 1984, 1986; Mander, Cohen, & Pooley, 2015; Mander, Lester, & Cross, 2015). Analyses of questionnaire responses revealed that only two dimensions of homesickness were predictive of psychological distress: ruminating about home and loneliness. These homesickness dimensions have been previously reported as contributing to psychological distress in secondary (Rudrum et al., 2022) and college boarding students (Moeller & Seehuus, 2019; Morrison & O'Connor, 2005). As protective measures, boarding students participating in the focus groups identified social interaction, immersion in activities, routine and keeping busy as antidotes to homesickness. The positive effects of activity, social acceptance and “belongingness” in overcoming homesickness have been supported by other authors (Bramston & Patrick, 2007; Watt & Badger, 2009). Having a good roommate was also considered important by focus group participants for addressing loneliness and especially in young boarding students. As an explanation of why the remaining homesickness dimensions did emerge as significant predictors of psychological distress (i.e. adjustment difficulties, missing friends and missing family), it is noted that the boarding students were experienced boarders and were surveyed later in the year after settling into school.

A limitation of the current study is its cross-sectional design and reliance on subjective participant recall. There is a need for longitudinal studies and an examination of the interplay between sleep and psychological factors with time. Given their dependency on school staff, a further limitation may be social desirability and the obligation on boarding students to minimize problems. An additional limitation and one also noted by Sprajcer et al. (2021) in their review of sleep in adolescents attending Australian boarding schools, is the need to include objective sleep measures in future studies, such as actigraphy. A similar methodological limitation is sampling of the focus groups, as it is acknowledged that while the students demonstrated a broad range of experiences and perspectives, selection bias likely impacts findings. We further note that children from rural areas (who formed the majority of boarding students in the present study), in contrast to children growing up in urban environments typically have limited healthcare access and educational opportunities (Byrne et al., 2017; Community Affairs References Committee, 2018; Guenther & Osborne, 2020; van Spijker et al., 2019). These factors were not explored as covariates in the present study and require future attention. Further, the present findings from one Adelaide school may not generalize to Australia's diverse boarding systems and there is a need for multi-school studies. Finally, for many Australian boarding schools, international students are an integral part of boarding culture. International boarding students face unique challenges and notably language and adjusting to an unfamiliar cultural environment (Yeo, 2010). Sleep problems are especially prevalent in international university students (Doo & Wang, 2020; Jiang et al., 2015; Pallos et al., 2005), but less is known about the sleep of international secondary boarding students. A particular area of concern is that time zone differences can result in home communications falling during sleep time, complicating the balance between psychosocial and sleep needs. Furthermore, we were unable to attain a large enough sample to examine unspecified/other gender as a variable, and more needs to be understood about the experience of gender diverse boarding school students.

Taken together, the present findings are consistent with previous research promoting the importance of adequate sleep for healthy adolescent development (Agostini et al., 2019; Short et al., 2020; Zhang et al., 2017). They suggest that routine and regulating technology use at night is successful strategies for improving sleep and that strategies which promote sleep and, as well, reduce homesickness have benefits for psychological well-being. At present, evidence-based policies for managing sleep

and homesickness are lacking (Australian Boarding Schools Association, 2020; Sprajcer et al., 2021; Standards Australia, 2015). We propose that the development of protocols is timely and needed.

AUTHOR CONTRIBUTIONS

Alexander Reardon: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision; writing – original draft; writing – review and editing. **Kurt Lushington:** Conceptualization; investigation; methodology; project administration; resources; supervision; writing – review and editing. **Andrew Junge:** Conceptualization; project administration. **Jonathan Crichton:** Formal analysis; methodology; writing – review and editing. **Alex Agostini:** Conceptualization; investigation; methodology; project administration; software; supervision; validation; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.


DATA AVAILABILITY STATEMENT


The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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