School Mental Health (2024) 16:1120–1140
https://doi.org/10.1007/s12310-024-09678-2

ORIGINAL PAPER

A Global Study of the Wellbeing of Adolescent Students During the COVID-19 2020 Lockdown

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Accepted: 6 June 2024 / Published online: 8 July 2024

Abstract

As the COVID-19 (SARS-CoV-2) virus spread across the world, countries took drastic measures to counter the disease by requiring their citizens to home self-isolate i.e., lockdown. While it was not known how young people would cope with the social distancing restrictions, there was concern that the lockdown would have a debilitating effect on youth mental health. This study examined whether there was an association between adolescent subjective wellbeing and the amount of time spent in lockdown. Global Research Alliance researchers in 15 countries collected data using the Mental Health Continuum (Keyes in Am J Orthopsych 76:395–402, 2006) from over 7000 middle-school students aged 11–18. Findings show a decline in eudemonic wellbeing, particularly among females during the first 6 months of lockdown, which was most strongly associated with diminished psychological wellbeing, followed by social wellbeing, while emotional wellbeing remained relatively stable. An adaptation effect was noted after approximately 6 months. There was evidence suggesting females were slower to adapt to lockdown conditions compared to males. More attention should be paid to the wellbeing of students in lockdown to overcome languishing tendencies and educators should be cognizant of diminished student wellbeing, particularly among females, when students return to school. Positive school experiences, and positive relationships within the school community, may assist in reducing the risk of languishing in lockdown conditions, so schools should design interactive online activities for off-campus learning.

Keywords Wellbeing · Eudaimonia · Hedonia · Psychological wellbeing · Social wellbeing · Gender differences · COVID 19

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Introduction

In 2020, as the world was overwhelmed by the COVID-19 (SARS-CoV-2) virus and its enormous death toll, countries took drastic measures to counter the disease by requiring their citizens to home self-isolate i.e., lockdown, to control the movement of people and curb the spread of infection (Douglas et al., 2020). In this process, only essential workers, such as medical and security personnel were exempt and academic activities were shifted to an online/electronic platform (for examples of lockdown conditions in different countries see Table 1). As a result, students were thrust into a distance learning format and were unable to attend in-person school (Reimers, 2022). In some countries, where personal computers and laptops were not available to all students, classes were televised or broadcasted through the radio (Makira & Owino, 2021) or as was common in the USA, school districts purchased laptops for students using funding provided by government COVID-19 relief funds. During this time, it was not known how young people would cope with the new schooling approach, restrictions, and demands.

As the pandemic continued across the world in early 2020, many scholars expressed concern that being consigned to lockdown would have a debilitating effect on youth mental health (Nearchou et al., 2020). Changes to an adolescent's learning and living environment, such as those experienced during the COVID-19 lockdown, where social isolation impedes close interactions with friends and peers, warrant investigation. Adolescence is a period during which an authentic and autonomous sense of self is developed through peer interactions outside of the family (Erikson, 1968). Exemplified by heightened sensitivity and vulnerability, the adolescent psyche differs from other life stages (Fuhrmann et al., 2015). Lockdown conditions that involve being away from best friends, schoolmates, and other friendship groups, as well as being unable to pursue extracurricular activities, could potentially impact adolescent development and wellbeing. The purpose of this study was to investigate this possibility.

An early Covid-19 lockdown study reported an increase in anxiety and depression among the general Chinese population just 2 weeks into the outbreak of the virus in China (Wang et al., 2020). Findings indicated that over half (53.8%) of the study respondents (aged 12 to 59) reported the psychological impact of the pandemic had been moderate or severe, despite the majority (60.81%) reporting no physical symptoms of the disease. According to this study, students showed greater susceptibility to stress, anxiety, and depression. Similar findings were reported by researchers in France (Mary-Krause et al., 2021), India (Rehman et al., 2021), and Greece (Fountoulakis et al., 2021). While details were scant, one would not be surprised to find that the mental health and wellbeing of adolescents in lockdown in other countries would be similarly impacted. The current study sought to address this supposition by focusing on adolescent wellbeing and investigating whether young people were more likely to languish in lockdown conditions.

Wellbeing

Several researchers (Diener et al., 2010; Ryff, 1989) have pointed out the distinctive and non-synonymous concepts of wellbeing and mental health. Mental health refers to the presence or absence of mental illnesses, such as those defined by the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (American Psychiatric Association, 2013). Wellbeing, however, is a broader concept that considers cognitive and emotional components of an individual's state of being and it should not be assumed that the absence of a mental health disorder means that an individual is satisfied and functioning well in life (Keyes, 2006).

Although several life domains of *subjective wellbeing*, such as material wealth, safety, health, and social and family connections, have been identified by scholars (Cummins, 1996), the lack of agreement amongst researchers on the number, and nature of domains, has enabled different perspectives to prevail. Difficulties in identifying domains and indicators of subjective wellbeing can be overcome by focusing on the essence of subjective wellbeing, which Diener et al. (2010) have argued, involves an assessment of the emotional state and satisfaction in one's life. In other words, conceptualizing that subjective wellbeing can be gauged by one's perceived proximity to "optimal human functioning" (Diener et al., 2010, p. 251) or flourishing in life. Moreover, Keyes (2006) extended this perspective beyond a one-dimensional view of subjective wellbeing by considering that individuals who were not flourishing could be languishing.

Keyes (2006) theorized that subjective wellbeing could be examined via two streams of research based on the concepts of *hedonia* and *eudaimonia*. Hedonia relates to emotional wellbeing, where individuals are primarily concerned with their happiness and general satisfaction in life, while eudaimonia is associated with social and psychological wellbeing. Eudaimonia encompasses an individual's purpose, abilities, capacities, and overall functioning in life. An individual is flourishing, Keyes surmised, when they exhibit a high level on at least one indicator of hedonia (emotional wellbeing,

Table 1 Details of lockdown conditions and data collection in each world region

Country	Formal lockdown?	Were people able to meet?	COVID 19 stringency index 2020*	Data collection
Australia	Yes—only one person was permitted to obtain household items e.g., groceries, medications Only essential businesses were open, and people were working from home where possible	No – persons were not able to meet in small groups or pay visits to a limited number of others	75.46	Data were collected through schools during scheduled online classes, during lockdown mandates in South Australia, Northern Territory, and Victoria
Chile	Yes—from March 18, 2020, in force throughout the national territory, for a duration of 90 days, then constantly extended to 180, 270, 360 and 469 days Until July 19, 2020, the confinement was total. Only essential businesses were allowed. Thereafter a Step-by-Step plan (which seeks graduality in the terms of quarantines in the different areas of the country) was introduced	No – not during the confinement stage. Persons were not able to meet at all or pay visits to anyone. The Step-by-Step Plan has relaxed these restrictions	90.28	Data were collected through schools during scheduled online classes, during the lockdown. Invitations were also sent through the students' email and on the social networks used and managed by the school
Greece	Yes—formal restrictions in education (from 18.03 till 30.06.2020 only online classes), only jobs of primary necessity were allowed and going out to obtain household items e.g., groceries, medications or walking with a dog	No—mass gatherings were restricted; a maximum of 6 people were allowed in the same location	84.26	Data were collected through schools during scheduled online classes, during lockdown. Invitations were also sent through the students' email and on the social networks used and managed by the school
India	Yes—essential items were delivered at home. Curfew was imposed and curfew passes were issued for frontline workers and essential services	No—police kept a strong check on movement	100.00	Data were collected through schools during scheduled online classes, during lockdown mandates in Punjab
Indonesia	Yes—only two persons per household were permitted to obtain household items e.g., groceries, medications. All entertainment businesses were closed, and only essential sectors were open e.g., Grocery stores, take away restaurants	No – persons were not able to meet in small groups or pay visits to a limited number of others Police and local security patrolled the city and neighborhood	80.09	Data were collected through schools during scheduled online classes, during lockdown mandates in South Sulawesi and Java Island
Israel	Yes – no one was permitted to go outside to gain household items (only through delivery)	No – people were not able to meet at all, under lockdown	91.67	Data were collected through online classes, during lockdown mandates in the central part of Israel
Italy	Yes—only 1 person per family was allowed to shop for food; only jobs of primary necessity were allowed	No—persons were not able to meet at all or pay visits to anyone	93.52	Data were collected through schools during scheduled online classes, during lockdown mandates in Northern Italy
Malta	No formal lockdown	Yes—people were able to meet but in small groups	87.04	Data collected through schools online
Mexico	Yes—on March 16, 2020, the Mexican federal government declared a national health emergency, and non-essential activities were suspended throughout the country	No—mass gatherings were restricted; a maximum of 10 people were allowed in the same location	82.41	During the lockdown, the online questionnaire was distributed through social networks to teachers, principals, and parents of schools in north-western Mexico so that they could distribute it to students

Table 1 (continued)

Country	Formal lockdown?	Were people able to meet?	COVID 19 stringency index 2020*	Data collection
Poland	Yes—formal restrictions in education (since 16.03 till 30.06. 2020 only online classes), in public transportation (only in a mask, with social distance), walking only with a dog or to the shop (1 person from family) (since 23.03.2020)	Partially, only two persons outdoor, family members from one household, religious ceremonies allowed (with a restricted number of participants)	87.04	Data were collected through school students' e-mail addresses, questionnaires were filled in individually at home, during lockdown mandates throughout the country
Portugal	Yes—online classes and personal contact avoidance	No—meetings and personal contact were avoided	87.96	Data were collected with the support of professors who allowed students to access the questionnaire through school channels
Russian Federation	Yes—in March 2020, educational institutions switched to a distance format. A high-alert regime was introduced in Moscow on March 5. After March 30, a self-isolation regime was officially introduced in Moscow and the Moscow region, then it was extended to other regions. Entertainment venues, beauty salons, cafes, and restaurants were closed. Only grocery stores, pharmacies, pet stores, delivery services, communication salons, and non-food stores, as well as city services necessary for the life support of the city, continued to work	No—in different regions of Russia, the self-isolation regime was introduced at different times depending on the spread of infection, and residents observed it with varying rigor. In Moscow, the Moscow region, and large cities, self-isolation was observed more strictly	87.04	Data were collected through schools during scheduled online classes, during the lockdown. The online questionnaire was distributed through the school principals, which then organized the school students' participation
Spain	Yes—only 1 person per family was allowed to shop for foods (it was a recommendation); only jobs of primary necessity were allowed	No- meetings and personal contact were not permitted	85.19	Data were collected with the support of professors who allowed students to access the questionnaire through school channels
Turkey	Yes—people were allowed to go out based on a schedule (e.g., people older than 65 – between 10:00 am and 2:00 pm, people younger than 20 – between 2:00 pm and 5:00 pm) except the essential workers. Essential workers could go to work any time	No – people were not able to meet even in small groups	77.78	Data were collected online through teachers during the lockdown. Invitations were sent to teachers and teachers monitored the students to fill out the questionnaires throughout the country
United States of America	No—regulations varied state by state. It was strongly recommended that people go out only for necessary activities (groceries, pharmacies) and work from home. Essential workers continued to work in person	Partially—varied by state. In most places, meeting people outside the household was strongly discouraged	72.69	Data were collected via personal contacts and social media invitations

*highest value during data collection April – November 2020

e.g., happiness) and on over half of the indicators of eudaimonia (social and psychological wellbeing, e.g., having warm and trusting relationships with others). The positive functioning elements reflective of eudaimonia include a sense of belonging, liking one's personality, having warm and trusting relationships, feeling confident, and having a sense of direction and meaning in life. As such, subjective wellbeing can be measured along a mental health continuum or spectrum, distinct from mental ill-health, where individuals at the upper end of the spectrum are flourishing, while at the lower end they are languishing, and showing moderate mental health otherwise. A study of adolescents aged 11–16 in four world regions found that on average, just under half (48%) of young people attending school were flourishing, while less than ten percent (9.5%) were languishing (Skrzypiec et al., 2020).

As a new phenomenon, it was important to understand how young people were impacted by being in lockdown, and whether any remediation would be needed as lockdowns ceased, and students returned to school. The study sought, therefore, to examine whether students were more likely to languish, rather than flourish while in lockdown.

We expected that the emotional needs of most middle-school students would generally be attended to since they would be in lockdown at home with family, so basic home comforts and their general hedonist needs would be satisfied. While there could be adolescents living in dysfunctional, violent, overcrowded homes, etc., we expected that within the middle-school population, this group would be a minority (Moody et al., 2018). Most students would be in their own home/room, with their own possessions and artifacts, and living with family members who love them. However, the lockdown necessitated the shutting down of on-campus schooling, sporting clubs, drama and music rehearsals, and most other extracurricular activities. Arrested involvement in these activities poses a threat to an adolescent's sense of accomplishment, competency, belonging, and optimal functioning in life. It was therefore expected that the lockdown would be negatively associated with students' social and psychological wellbeing.

Wellbeing Gender Differences

There is emerging evidence that adolescent females nationally and internationally are reporting more mental health problems than boys (Jerdén et al., 2011—as self-rated health; Skrzypiec & Askell-Williams, 2017). Research by Green, et al. (2005) of 11–15 year olds in the UK found emotional disorders were higher in girls (4.1%) than boys (3%), while another study of the status of girls in Indiana, USA by Kuter and Deom (2013) reported that daily feelings of sadness or hopelessness were more likely to have been conveyed by females than males. The Indiana study also found that the percentages of girls reporting this disposition increased from grade six to grade eight or nine and then decreased.

A recent study by Campbell et al. (2021) examining data across 73 countries found that generally, girls experienced poorer mental health across all mental health and wellbeing indicators. Life satisfaction and psychological distress exhibited the most significant mean differences between the sexes, while hedonia and eudaimonia showed comparatively smaller gender gaps. While females reported more psychological distress than males in all countries, they found hedonia and eudaimonia showed the greatest variations cross-culturally. They found that wealthier European nations generally exhibited poorer average mental health outcomes for females across all measures except hedonia, while Eastern Mediterranean countries consistently show smaller gender gaps and better average outcomes for females in hedonia and eudaemonia. Certain countries such as Sweden, Finland, Slovenia, and South Korea consistently displayed some of the largest gender gaps in mental health. These findings suggest that gender differences in wellbeing would be expected during the lockdown and that these differences would vary according to country.

Duration of Lockdown

The duration of country lockdowns and school closures in 2020, which in most countries began on March 11, 2020 (following China's lead on January 26, 2020), varied from place to place (Reimers, 2022). Complete and partial school closures ranged from approximately 1 month in Oceania to 20 weeks in Latin America, with an overall world average of 14 weeks by the beginning of January 2021 (UNESCO, 2021). As countries across the world went into lockdown, researchers from the Global Research Alliance (see researchall.org) were prompted to collaborate on this wellbeing study of adolescents.

As shown in Table 1, the global team of researchers was in world regions that (except for Malta & some states in the USA) enforced lockdown restrictions on their citizens, causing students to learn through distance education. Study participants were able to provide information about their experiences during distance learning and lockdown. Disparities in the period of lockdown in countries provided an opportunity to examine variations in wellbeing, according to the length of time adolescents were in lockdown.

Study Aims

This study sought to examine whether there was an association between adolescent subjective wellbeing and the amount of time spent in lockdown, with an expectation that overall subjective wellbeing, as a product of hedonia and eudaimonia, would diminish. Furthermore, the study aimed to investigate the association between student hedonia (emotional wellbeing) and eudaimonia (social and psychological wellbeing), and time in lockdown. We expected that hedonia would not be generally impacted, as most middle-school students would be with their families and their most hedonistic needs would be provided for. By contrast, we expected that eudaimonia would decline since young people were away from friends and activities that provided them with a sense of identity and purpose.

The study also aimed to explore gender disparities in overall wellbeing, including hedonia and eudaimonia during the lockdown. We expected that females would generally experience poorer outcomes compared to males, although the extent of this difference was expected to vary across countries.

Method

Research members of the Global Research Alliance invited schools with students considered typical of the location to anonymously answer questions in an online purpose-built questionnaire (Impact of COVID-19 questionnaire) that was developed using Qualtrics online survey software. With a few exceptions (Poland & USA) questionnaires were completed by students during an online class session, so the response rate was over 90% in each of these locations.

Data were gathered during the period when countries implemented strict lockdown measures, as evidenced by the high Stringency Index Values in each country (see Table 1) derived from the Oxford Coronavirus Government Response Tracker (OxCGRT) and made available by Hale et al. (2021). The Stringency index incorporates nine response metrics (school closures; workplace closures; cancellation of public events; restrictions on public gatherings; closures of public transport; stay-at-home requirements; public information campaigns; restrictions on internal movements; and international travel controls) where high values indicate stricter responses (i.e., 100 = strictest response). Students completed the online questionnaire during the time they were experiencing the lockdown restrictions through school channels (except in the USA, where schools were closed, and a snowball approach was used).

Researchers in non-English speaking countries translated the questionnaire from English to the local language (see Appendix, Table 3). The back-translation method (Beaton et al., 2000) was used to check the accuracy of meaning. In total, the questionnaire was translated into 15 different languages.

Ethical approval from each researcher's university or appropriate authority was attained. Online parental and student participant consent was sought through the Global Research Alliance website (research-all.org). Questionnaire data were collected across 2020 from April to November.

Measures

In addition to demographics (country, age, sex, grade level, and name of school) which were the final questionnaire items for respondents, participants were also asked about where they had been in lockdown (at home with family, at home alone, in a hotel with family, other) and whether they communicated (texting, social media etc.) with friends during the lockdown.

Time in Lockdown

Each student self-reported the amount of time they had been in lockdown up to the time they completed the questionnaire by responding to a question that asked: "How many days were you in lockdown?". Responses were re-coded by the first author into the corresponding number of days (e.g., "3 months": 90 days) or as missing ("don't know"; "don't remember"). Estimations were made for recoding responses such as "since it began" by calculating the number of days since the lockdown began in that country and the time of the questionnaire. "I have not been in lockdown" was recoded as "0". Where possible "a long time" was re-coded to match the mode time of lockdown for other individuals in the same school and recoded as missing otherwise. Overall, the number of days in lockdown was missing for 6.6% (n = 554) of respondents. There were a substantial number of participants (n = 140) who indicated that despite directives, they had not been in lockdown i.e., some students reported leaving their homes every day. This group became a critical baseline for wellbeing comparisons.

Wellbeing

The short form of the Mental Health Continuum (Lamers et al., 2011) was used to assess students' subjective wellbeing. We used the stem "while in lockdown I …" before listing the response options, which included the three items that represent *emotional wellbeing* (e.g., happy), the six items that represent *psychological wellbeing* (e.g., That you had something important to contribute to society), and the five items that represent *social wellbeing* (e.g., That you liked most parts of your personality).

Socially Desirable Responding

Three social desirability items were included in the questionnaire. Students (5.4%, n = 452) who scored the highest possible total score of 15 on the items (e.g., I have always told the truth), measured on a 5-point Likert-type scale ("not true at all" to "true nearly all the time"), were excluded from the final database.

Sample

By the end of 2020, 8,345 students from diverse cultures across the world, had completed the questionnaire. However, only data from countries that had more than 50 participants (before data cleaning) were included for the purposes of analysis. Following the removal of students who responded in a socially desirable manner, and students who described their gender as non-binary (1.1%, n = 88; because there were insufficient numbers in each country to enable comparisons) the final sample used for analysis comprised 7,808 students from 15 countries (Australia, Chile, Greece, India, Indonesia, Israel, Italy, Malta, Mexico, Poland, Portugal, Russia, Spain, Turkey, USA).

Data Analysis

Data analysis was undertaken in SPSS v27 and Mplus v8.2. A categorical variable "time in lockdown" was created by dividing time into 3-monthly increments (i.e., No lockdown, less than 3 months, 3–6 months, and more than 6 months). Total wellbeing scores were calculated by summing all variables in the MHC scale (Keyes, 2006). Hedonia was measured as the sum of the three items comprising emotional wellbeing, while a score for Eudaimonia was calculated by summing all remaining items.

A categorical variable based on the MHC spectrum was formed, comprising groups classified as flourishing, exhibiting moderate mental health, or languishing following Keyes' (2006) procedure of assessing student experiences. Individuals who reported experiencing positive emotions every day or almost every day, along with meeting at least six out of eleven indicators of positive functioning in the past month, were categorized as flourishing. Conversely, those who reported experiencing these positive emotions "never" or only "once or twice" on at least six measures of eudemonic wellbeing, as well as at least one measure of hedonic wellbeing, were assessed as languishing. The remaining individuals, falling between these two categories, were assessed as exhibiting moderate mental health.

Controlling for country as a covariate, univariate GLM, with fixed covariates of gender and the time in lockdown, was used to examine variations in wellbeing during the lockdown. Scores for total wellbeing, Hedonia, and Eudaimonia, formed the continuous dependent variables for the GLM analyses. Partial eta squared (η^2) was calculated as the effect size and Bonferroni adjustments were used for between time in lockdown categories post hoc analyses. The variance ratio (largest variance divided by smallest) for all GLM analyses was less than 1.5, suggesting that the homogeneity of variance was satisfactory for the analyses (Blanca et al., 2018). A GLM analysis to examine country differences in wellbeing across the lockdown period was not possible as the variance ratio was not satisfactory. Some countries had less than the required number of respondents in each category, so a chi-square analysis was not acceptable for country comparisons. In other chi-square analyses, Cramer's V indicated effect size. T-tests using a Bonferroni p-value of 0.003 as an adjustment for error due to multiple comparisons (Field, 2018), were undertaken in each country to examine gender differences.

Confirmatory Factor Analysis (CFA) was undertaken in Mplus using the estimation method MLR (robust to skewness) to show the convergent validity of the MHC scale (see Appendix, Fig. 14). The modeling used Type = Complex, where data were clustered by country to account for the nestedness of the data. Model fit was based on fit indices described by Brown (2015). The reliability of each latent factor was measured using Hancock and Mueller's (2001) "coefficient H". Measures of Emotional Wellbeing (Coeff H = 0.865), Psychological Wellbeing (Coeff H = 0.852) and Social Wellbeing (Coeff H = 0.884) were found to be reliable. The CFA of all 14 items in the MHC scale, grouped into the appropriate factor of emotional, social, and psychological wellbeing, fit the data well ($\chi^2(74) = 1225.9$, $p < 0.00001$; RMSEA = 0.051, RMSEA 90% C.I. = 0.048 – 0.053, probability RMSEA ≤ 0.05 = 0.358; CFI = 0.941; TLI = 0.927; SRMR = 0.041).

Results

Sample

Participants were aged 10 to 18 with an average age of 14 years 4 months ($SD = 1.89$). As shown in Table 2, the sample was quite diverse ranging in terms of cultural background and age. Approximately one-quarter of the participants did not provide information about gender (missing = 2000 – 25.7%). Over half (n = 3327, 57.3%) of the participants who provided information about their gender were females, so males were under-represented in our sample (42.7%). The majority (95.2%) of students responded that they had been in lockdown at home with their family

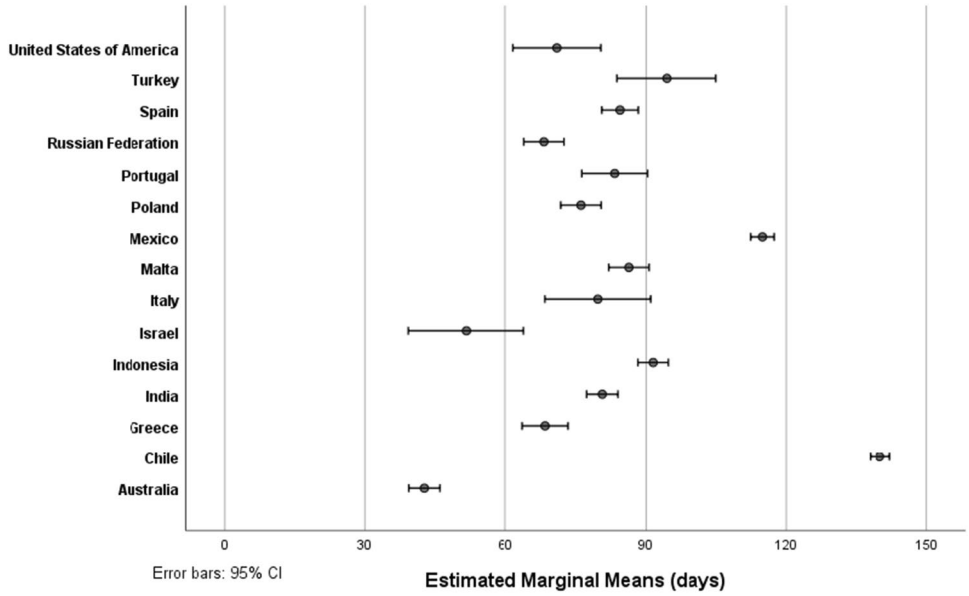

Fig. 1 Mean number of days participants from each country spent in lockdown (Self-report)

Table 2 Demographic details of participants from each country

	Male		Female		Age	
	Number	*Percent*	*Number*	*Percent*	*AVERAGE years*	*S.D. years*
Australia	263	46.6	301	53.4	13.17	1.36
Chile	596	44.9	730	55.1	13.72	1.66
Greece	115	41.5	162	58.5	14.29	1.87
India	157	43.1	207	56.9	14.77	1.97
Indonesia	159	33.6	314	66.4	15.00	1.65
Israel	17	44.7	21	55.3	16.05	2.27
Italy	24	49.0	25	51.0	15.35	2.79
Malta	129	44.3	162	55.7	12.86	1.44
Mexico	460	43.4	599	56.6	15.41	1.56
Poland	116	33.0	236	67.0	14.38	2.06
Portugal	63	50.4	62	49.6	13.85	1.99
Russian Federation	127	40.2	189	59.8	15.51	1.87
Spain	202	45.4	243	54.6	13.68	1.33
Turkey	17	32.1	36	67.9	14.11	1.35
United States of America	36	47.4	40	52.6	12.72	1.43
	2481	42.7	3327	57.3	14.30	1.89

and had communicated with friends (91.0%) during that time.

Time in Lockdown

The mean time spent in lockdown by participants was 96.13 days (*SD* = 53.1), while the median and mode of time in lockdown was 90 days. As shown in Appendix, Table 3, time spent in lockdown ranged from no days to 300 days. A common feature of country lockdowns was a tendency for them to end in monthly increments—visible in Appendix, Fig. 15, as peaks at the monthly points in the frequency graph (30 days, 60 days, etc.).

Comparison Group: No Time in Lockdown

A few participants from nearly all countries (exceptions: Italy, India, Indonesia, and Portugal) reported that they spent no time in lockdown. This small group (n = 140, 1.9%) of students, just over half (54.4%, n = 40) of whom were males, was similar in age (average age = 14 years 2 months, *SD* = 2.0) to the rest of the sample. Just under one-third of participants in this group were from Australia (30.0%,

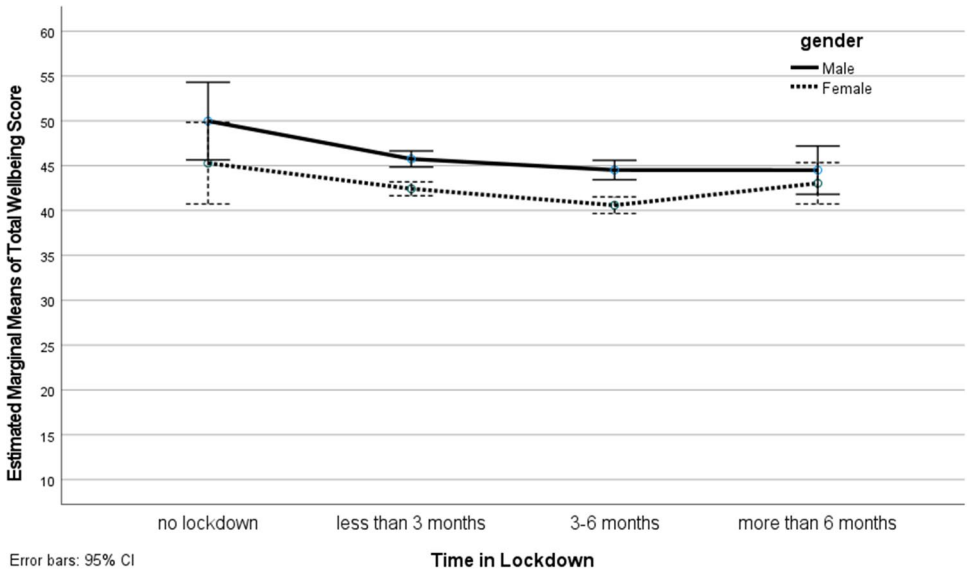

Fig. 2 Total wellbeing scores of males and females during the lockdown period

n = 42) and Mexico (29.3%, n = 41), while approximately ten percent were from Spain (12.1%, n = 17) and Chile (9.3%, n = 13). Although small, the diversity of this group included individuals from countries with the shortest (i.e., Australia, median = 28 days) as well as longest (i.e., Chile, median = 150 days) time in lockdown, and proffered as a suitable comparison group for analysis. As shown in Fig. 1, the amount of time participants spent in lockdown varied between countries. Half of all participants spent 3 months or less in lockdown.

Wellbeing

Students' total wellbeing scores varied with time in lockdown ($F(3) = 6.19$, $p < 0.001$, partial $\eta^2 = 0.003$). Students who reported not being in lockdown had higher total wellbeing scores than students in lockdown for any amount of time, as shown in Fig. 2.

Post hoc tests showed no significant difference in total wellbeing scores of students not in lockdown and students in lockdown for less than 3 months (Mean difference = 3.36, $p > 0.05$) or more than 6 months (Mean difference = 3.62, $p > 0.05$). Students in lockdown 3–6 months, had lower total wellbeing scores than students not in lockdown (Mean difference = 4.95, $p < 0.05$) and students in lockdown less than 3 months (mean difference 1.59, $p < 0.003$). Students in lockdown for 3–6 months had, on average, the lowest wellbeing scores.

While there was a difference between students in lockdown for less than 3 months and 3–6 months, there was no difference in the total wellbeing scores of students in these two groups and students who had been in lockdown for more than 6 months. This suggests a possible adaptation effect, where student wellbeing declined until a lockdown period of 6 months and stabilized thereafter.

Males and females followed the same trend, although gender differences were significant ($F(1) = 12.5$, $p < 0.001$, partial $\eta^2 = 0.002$) and most pronounced within the first 6 months of the lockdown. Throughout the lockdown period, males showed higher wellbeing scores than females.

As shown in Fig. 3, overall when time in lockdown was controlled, gender differences in Total Wellbeing scores were also evident ($F(1) = 15.17$, $p < 0.001$, $\eta^2 = 0.003$; Male mean = 44.68, $SE = 0.547$; Female mean = 41.86, $SE = 0.475$). Furthermore, in countries where gender differences were significant, males showed higher mean total wellbeing scores than females.

Hedonia

Students' Hedonia scores did not vary significantly across time in lockdown ($F(3) = 1.90$, $p > 0.05$) indicating no significant changes in students' emotional wellbeing during the lockdown. There were notable differences between males and females ($F(1) = 10.82$, $p < 0.001$, $\eta^2 = 0.002$), with males demonstrating significantly higher levels of hedonia compared to females. This difference was especially prominent among individuals who had been in lockdown for less than six months. (see Fig. 4).

Figure 5 illustrates that gender differences were evident in five countries (Spain, Portugal, Mexico, Chile, and Australia). In each of these cases, males had higher scores on hedonia compared to females.

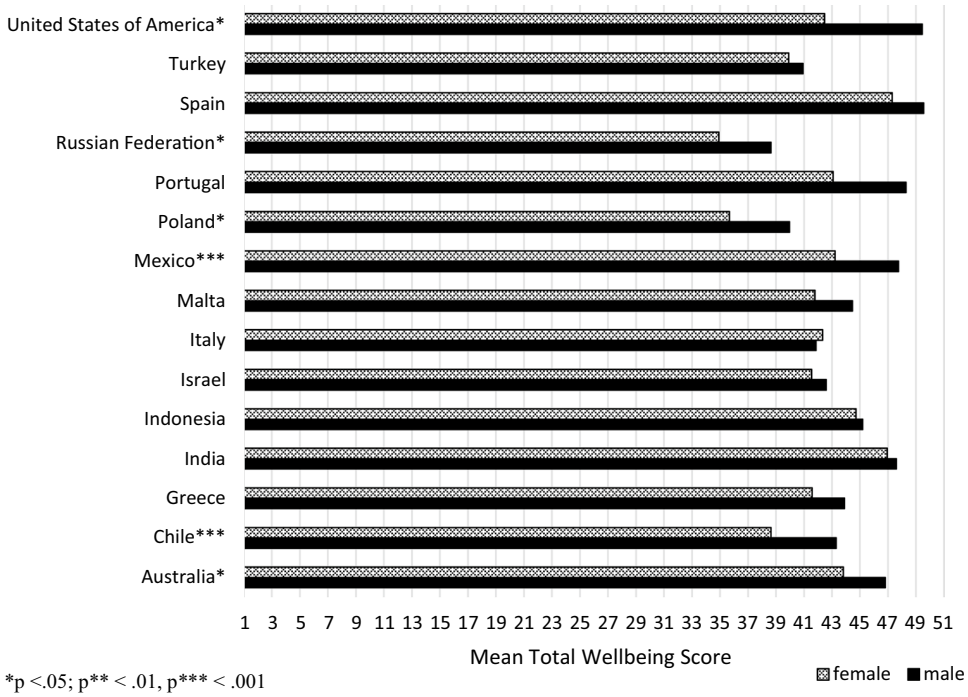

Fig. 3 Mean total wellbeing scores of males and females in different countries during lockdown

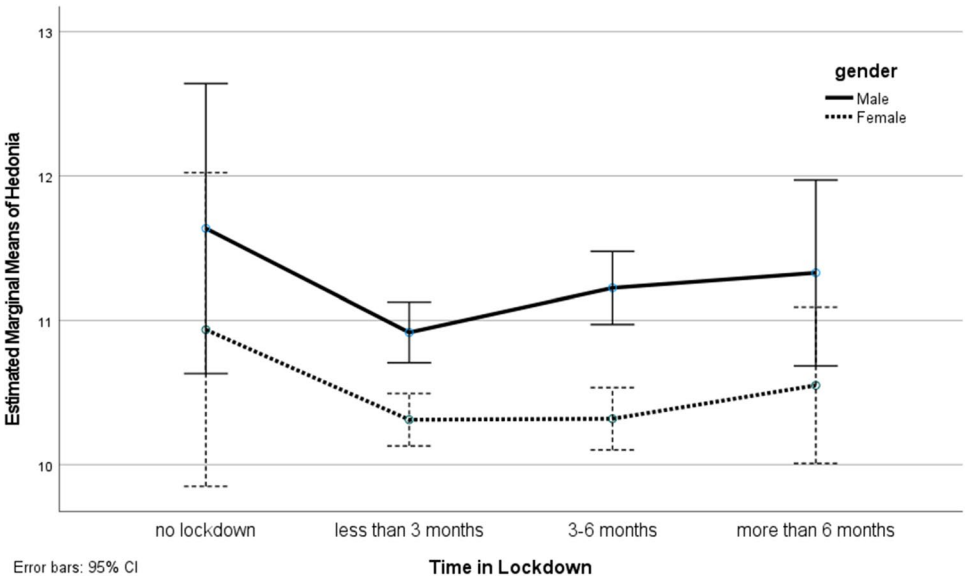

Fig. 4 Mean Hedonia scores of males and females during the lockdown period

Eudaimonia

Students' scores on Eudaimonia varied across time ($F(3) = 9.05$, $p < 0.001$, partial $\eta^2 = 0.005$). Post hoc tests showed no statistical difference in the Eudaimonia scores of students not in lockdown and students in lockdown less than 3 months, or more than 6 months. Students in lockdown 3–6 months, had lower Eudaimonia scores than students not in lockdown (Mean difference = 4.39, $p < 0.005$), and students in lockdown less than 3 months (Mean difference 1.69, $p < 0.001$). Students in lockdown for 3–6 months had, on average, the lowest scores on Eudaimonia (see Fig. 6).

Male and female students differed in the eudaimonia scores across the lockdown period ($F(1) = 12.5$, $p < 0.001$, partial $\eta^2 = 0.002$). As shown in Fig. 6, females in lockdown less than six months showed significantly lower Eudaimonia scores than males in lockdown for the same time.

Gender differences in Eudaimonia scores within countries, where males showed significantly higher Eudaimonia scores than females, were evident among students in

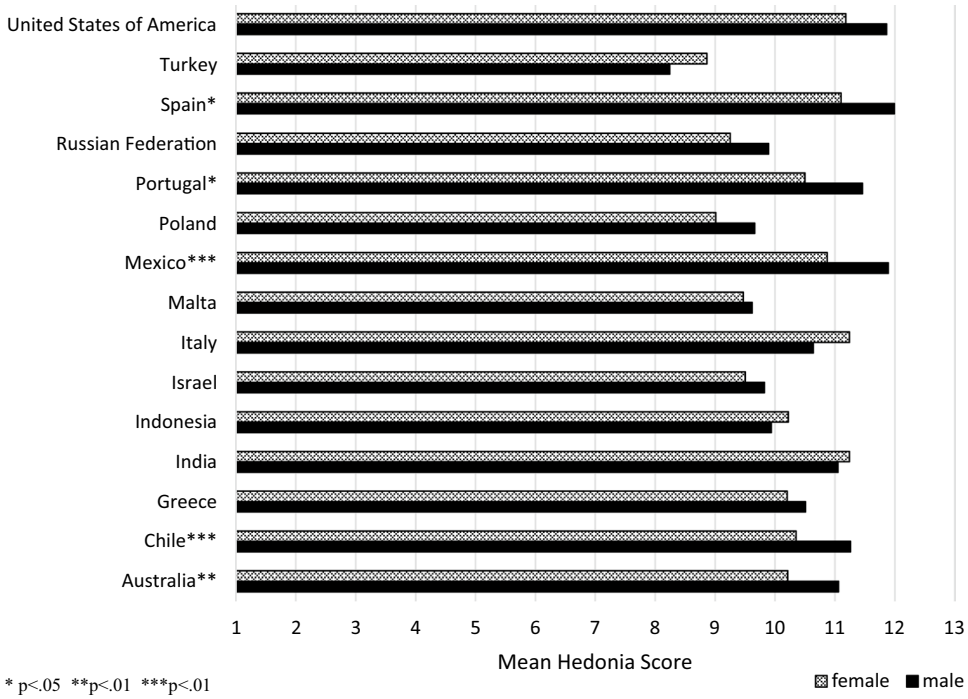

Fig. 5 Mean Hedonia scores of males and females by country during lockdown

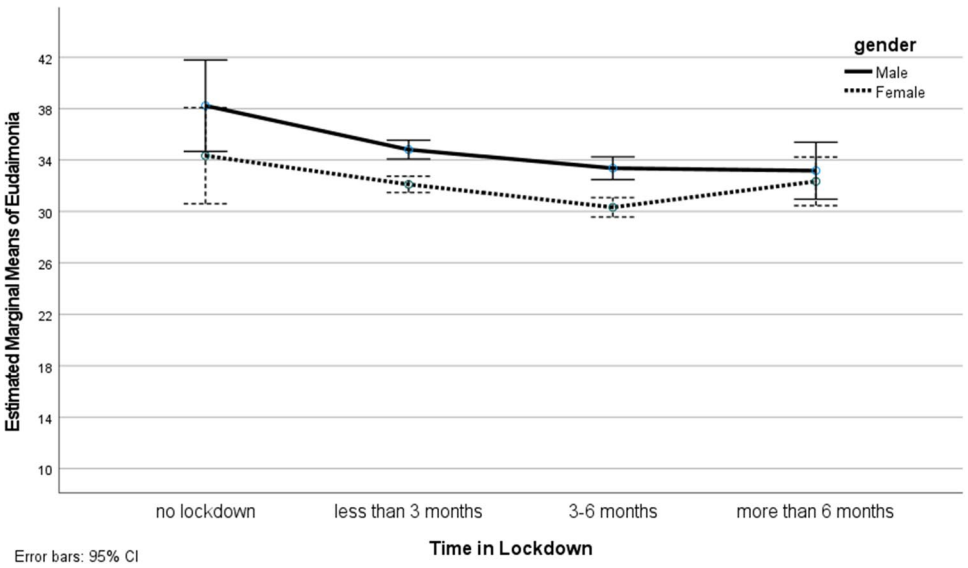

Fig. 6 Male and female eudaimonia scores during the lockdown period

Australia, Chile, Mexico, Poland, Portugal, the Russian Federation, and the USA (see Fig. 7).

Psychological and Social Wellbeing

Psychological wellbeing showed a trend of declining and then stabilizing after 6 months ($F(3) = 13.19$, $p < 0.001$, partial $\eta^2 = 0.007$ – see Fig. 8), as did social wellbeing (see Fig. 9) ($F(3) = 4.55$, $p < 0.003$, partial $\eta^2 = 0.002$). Females exhibited lower psychological wellbeing ($F(1) = 12.06$, $p < 0.001$, partial $\eta^2 = 0.002$ – see Fig. 8) and social wellbeing ($F(1) = 7.40$, $p < 0.01$, partial $\eta^2 = 0.001$ – see Fig. 9) compared to males during the lockdown, especially within the initial six months of lockdown.

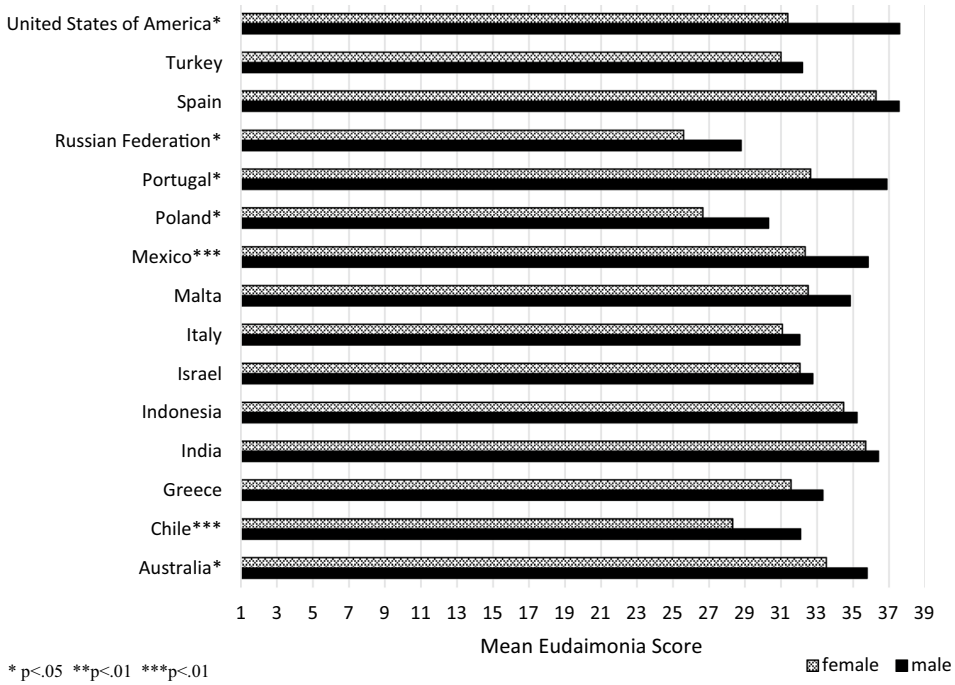

Fig. 7 Mean eudaimonia scores of males and females by country during lockdown

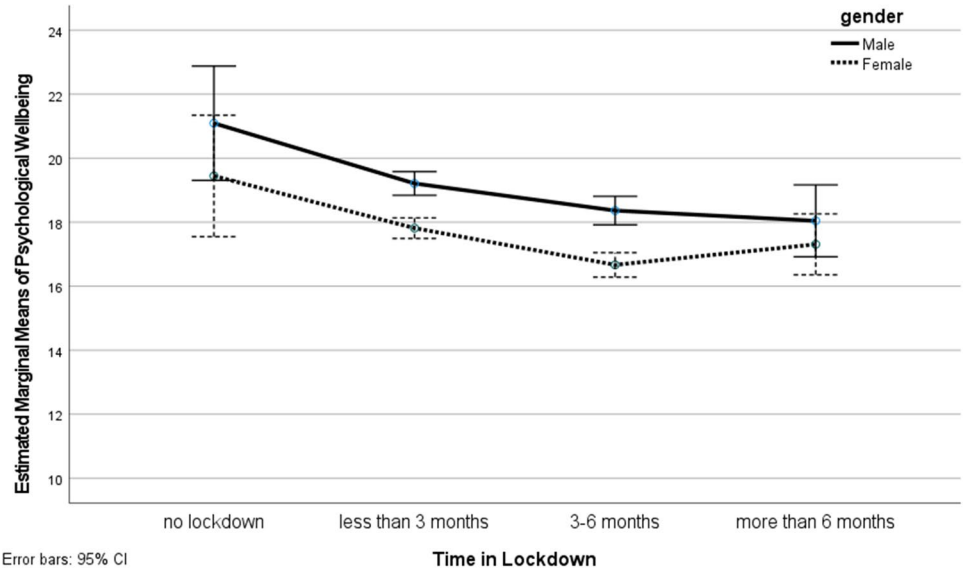

Fig. 8 Student psychological wellbeing scores during the lockdown period

However, the effect size estimation suggests that the underlying change in student wellbeing was more strongly associated with changes in psychological wellbeing ($\eta^2 = 0.007$) than social wellbeing ($\eta^2 = 0.002$). This was also the case for both males and females.

In various countries, a notable gap in psychological wellbeing scores between genders was observed, with male students consistently displaying markedly higher scores than their female counterparts (see Figs. 8, 10).

Across various countries, it was evident that male students achieved significantly higher social wellbeing scores compared to female students (see Fig. 11).

Flourishing and Languishing

Categorizing wellbeing along the MHC spectrum revealed that over half (57.5%) of the students who had not been in lockdown were flourishing, while less than 10% were languishing (9.4%).

In comparison to the students in the no-lockdown group, fewer students were flourishing, and more were languishing ($\chi^2(6) = 21.1$, $p < 0.002$, Cramer's $V = 0.043$, $p < 0.002$). A downward trend in flourishing, and an upward trend in languishing, was evident across the lockdown period for both

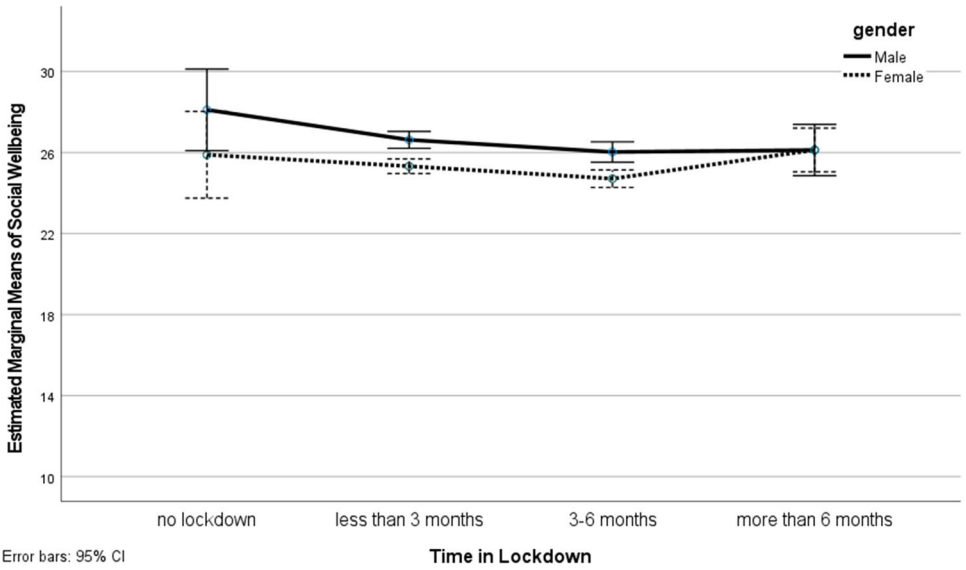

Fig. 9 Student social wellbeing scores during the lockdown period

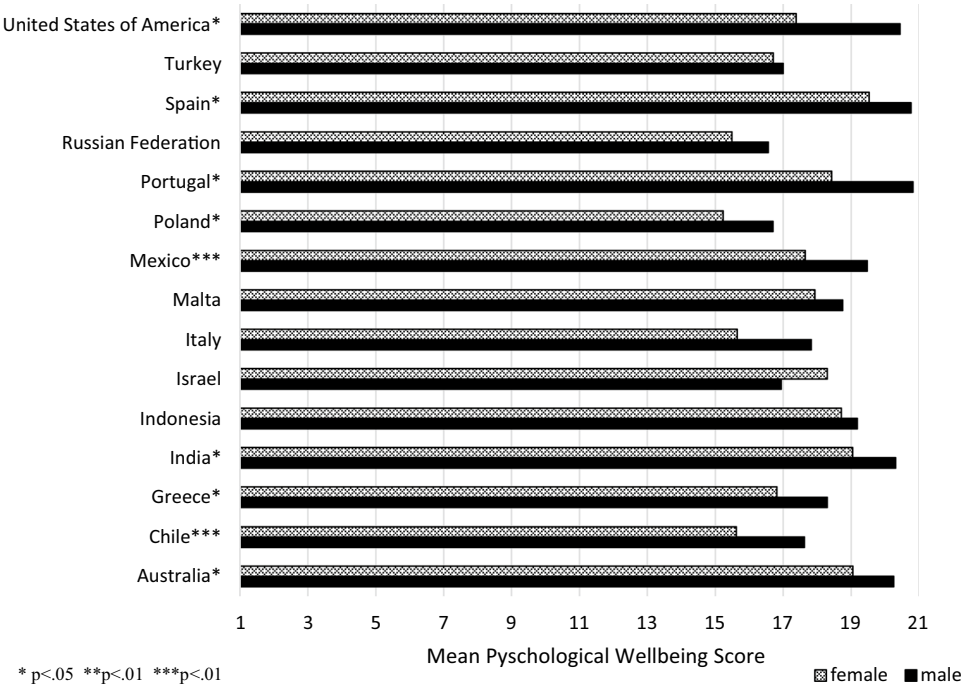

Fig. 10 Mean psychological wellbeing scores of males and females by country during lockdown

male and female students in lockdown, as shown in Figs. 12, 13, respectively.

In the first 6 months of being in lockdown the wellbeing of males and females differed significantly[1] whereby males (50% or more) were more likely to flourish than females (less than 50%), and females (approximately 14%) compared to males (9%-10%) were more likely languish, as illustrated in Figs. 12, 13. Statistically significant differences were not evident for males and females not in lockdown, or in lockdown for more than 6 months.

Discussion

Overall, the lockdown had a detrimental effect on middle-school students who were less likely to flourish and more likely to languish while in lockdown. The decline in wellbeing was most strongly associated with diminished

[1] <3 months: $\chi^2(2)=18.7$, $p<.001$, Cramer's $V=0.08$, $p<.001$; 3–6 months: $\chi^2(2)=23.1$, $p<.001$, Cramer's $V=0.11$, $p<.001$.

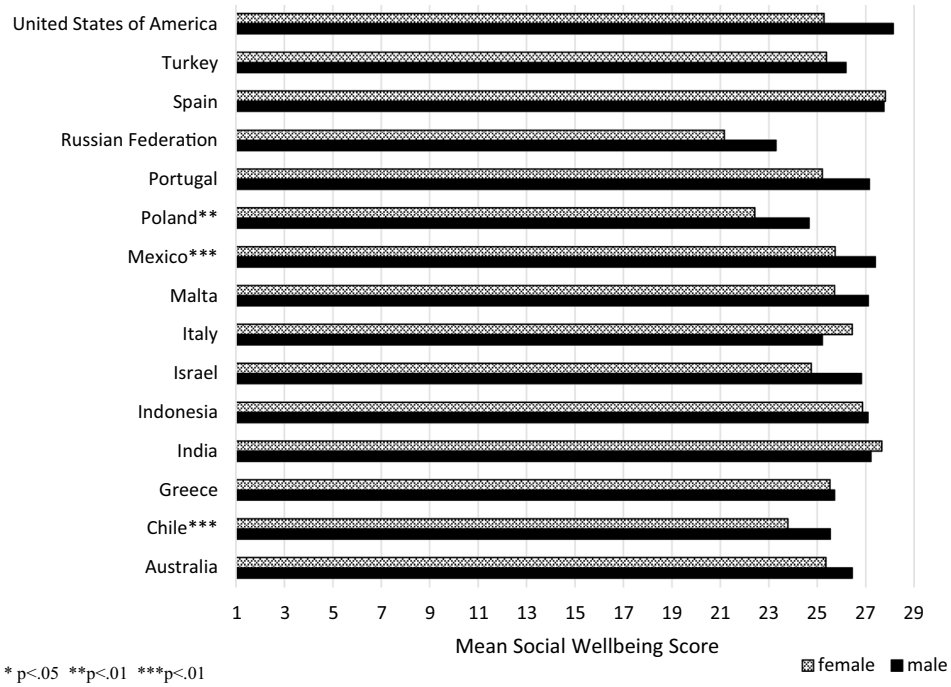

Fig. 11 Mean social wellbeing scores of males and females by country during lockdown

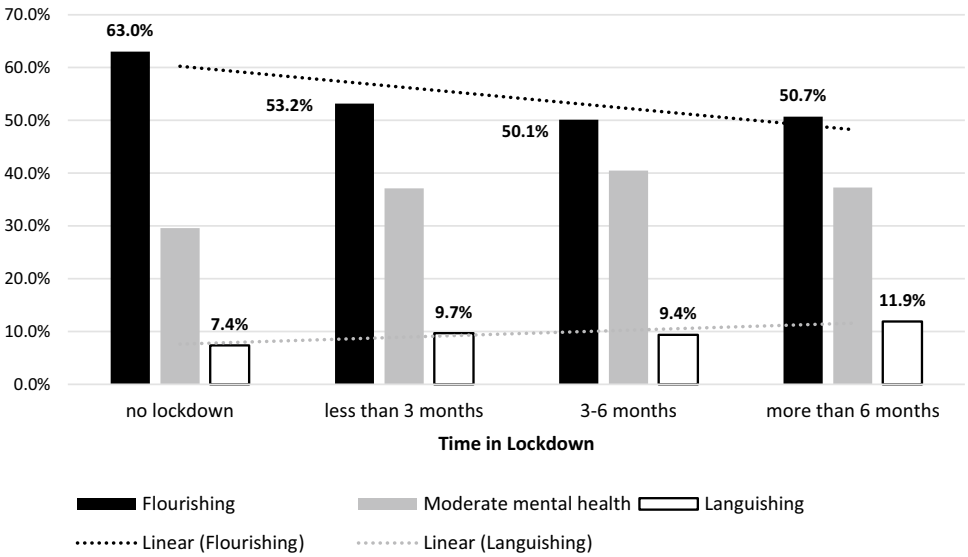

Fig. 12 Male flourishing and languishing groups during the lockdown period

psychological wellbeing, followed by social wellbeing, while emotional wellbeing remained relatively stable. However, although not insignificant, the effect sizes were small, suggesting that the proportion of adolescents languishing during the lockdown was small. This small group of languishing individuals is nonetheless of concern, particularly among females (14% in the first 6 months of lockdown). It suggests that one in ten male and one in seven female students showed impaired functioning and psychological wellbeing during the lockdown.

Psychological wellbeing is associated with purpose, belonging, and one's view of society, factors that heightened in importance, meaning, and saliency during the lockdown. With no physical presence at school and in extracurricular activities, students lost their connection to social and psychological facets of these links to their personal identity. Signposts of being a freshman, in a club, or in the last year of elementary or secondary school, were absent; special events such as graduation, school dances, drama, and music performances were missed; opportunities to enjoy and excel in team sports, school bands and other clubs, were gone. Inextricably linked, social wellbeing was similarly impacted, although, as the findings suggest, not as strongly.

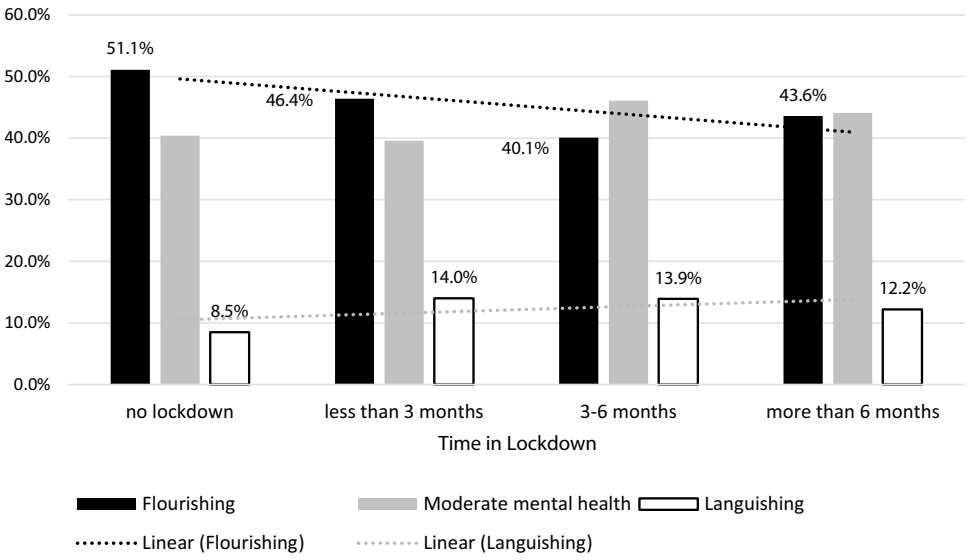

Fig. 13 Female flourishing and languishing groups during the lockdown period

Social media and its ubiquitous presence in adolescents' lives, may have thwarted the detrimental impact of the lockdown on social wellbeing, as it may have provided a constructive social function. Over 90% of participants in this study reported that they communicated with friends through social media and other electronic means during the lockdown. These actions may have sustained social connections and enabled a sustained level of social wellbeing. A comprehensive qualitative study by Boyd (2014) found that social media platforms facilitate identity development away from adults and that social media "plays a crucial role in the lives of networked teens … social media has become an important public space where teens can gather and socialize broadly with peers in an informal way" (p. 5). Although a recent 9-year longitudinal study of German adolescents by Schemer et al., (2020), found no substantial relationship between the frequency of internet and SMS use and subjective wellbeing, it showed that there was no overall detrimental effect. However, this study was conducted before the pandemic began, in an era when study findings of the detrimental and beneficial effects of internet use were mixed and inconclusive (Schemer et al., 2020).

While the use of social media may have been beneficial during the lockdown, of great concern with internet use is cyberbullying and cyber victimization. It would be expected that involvement in cyberbullying would increase during lockdown as time spent online was greater than before the pandemic. However, the opposite was found. In a study of Canadian adolescents, Vaillancourt et al., (2021) found that "rates of physical, verbal, social, and cyberbullying victimization and perpetration were higher before the pandemic than during the pandemic" (p. 561). Vaillancourt et al., attributed this reduction to an increase in student monitoring by teachers and parents, particularly the latter, who were often tasked with supervising their children at home. Indeed, this reasoning accords with findings from several studies that have found a reduced risk of cyberbullying when parents monitor their children's online activities (Aoyama et al., 2012).

Generally, adolescents coped with the lockdown during the first three months. However, eudaimonia weakened in the following three months and then stabilized after 6 months in lockdown. It is not clear why a declining trend did not continue as time in lockdown increased. One explanation could be that there was an adaptation effect, as students adapted/adjusted/acclimatized to the new conditions of living, and learning, and found other ways to deal with the changes in their lives. A qualitative study by Antonini et al., (2020) of music teachers and their students, and athletes and their coaches, during the lockdown found that it was possible to establish a long-distance relationship that "led to feelings of satisfaction and fulfillment" (p. 5) for the learner. The timeframe for this process was not clear, but the study found evidence that some students stopped their activities early in the lockdown before starting again, while others were pushed to find alternative clubs "in order to reverse the negative trend which they found themselves following" (p.5).

Overall, males exhibited significantly higher levels of wellbeing compared to females, with clear gender differences observed within some individual countries. The data indicated that females, on the whole, may have experienced more challenges than males during the initial six months of lockdown, implying that they may have taken longer to adapt to the lockdown conditions.

Because we couldn't compare the wellbeing of male and female students between countries, it's uncertain whether the gender differences found in this study were due to varying wellbeing levels between males and females, or if they were

linked to differences in wellbeing within each country. Additionally, we couldn't determine if the wellbeing of males and females resulted from a general tendency for males to have higher wellbeing levels than females, especially in certain countries—an interaction effect between gender and country. However, the results provide further support for Campbell et al.'s (2021) conclusion that girls generally have lower levels of wellbeing across all indicators.

When this study began in 2020, it was not anticipated that young people would be in lockdown more than once, or for long periods of time, so an anonymous cross-sectional study was designed. A longitudinal study, however, would have overcome the limitations of this cross-sectional study, by using a repeated measures research design, which would have collected data from the same individuals at regular intervals during the lockdown period, rather than comparing different individuals across the 2020 lockdown period. A longitudinal study is, hence, the recommended approach for any future studies of young people in lockdown.

Due to the anonymity of participation, it was not possible to determine how non-respondents differed from respondents. It could be that the study respondents were the ones less affected by the lockdown (e.g., who were not too depressed to participate), in which case our findings would be reflective of the minimal impact of the lockdown. This would suggest that even among the less affected, the lockdown had an impact on student wellbeing.

Other limitations of this study include that the study was based on student self-reports, particularly regarding the period in lockdown, and that the variable for the time in lockdown was skewed, necessitating the use of conservative non-parametric statistical procedures. The questionnaire was translated into 15 different languages, and while forward and backward translation procedures were used, this is also a limitation of the study. Comparison groups were small, and analyses would have benefited from a larger sample size. It was not possible to compare countries due to a very small number of participants in some countries.

A strength of the study is that it offers insights into adolescents' experiences during the first occurrences of COVID-19 lockdowns in the world, at a time when there were so many unknowns. School administrators were uncertain about their decisions, and how they could best protect their staff and students, and they showed concern about the impact of the lockdown on the school community (e.g., see letter one Australian school principal wrote to his staff, Appendix, Table 4). Given the dynamic nature of the COVID circumstances in terms of timelines and durations of lockdowns, and the challenge of capturing the experiences of young people in this many countries within the first year of the pandemic, this study provides an important and unique report.

Study findings suggest that more attention should be paid to the wellbeing of students in lockdown to overcome languishing tendencies. Organizations such as schools, sporting clubs, and other institutions, should take steps to ensure they maintain close contact with students and young members, to minimize the impact of shutting down normal face-to-face interactions and opportunities on the psychological and social wellbeing of young people. Furthermore, parents should monitor, but at the same time encourage, their adolescent children to use electronic means, including social media, to maintain contact with friends and peers.

Upon returning to school, educators should be cognizant of diminished student wellbeing during lockdown and should initiate strategies to improve the wellbeing of students, particularly females, using a variety of self-valuing and positive psychology approaches. Varela et al. (2019) confirmed that school life was very important for adolescents' wellbeing. They highlighted the significance of positive school experiences, and positive relationships within the school community, as factors pertinent to student wellbeing. Our findings suggest that these factors too, may assist in reducing the risk of languishing, when students are experiencing lockdown conditions and that schools should move classes to an online platform and design interactive online activities rather than completely shut down.

Implications for School Mental Health Practice

Although this study centered on the 2020 pandemic lockdown, its findings highlight the significance of addressing the eudaimonic needs of adolescents. During adolescence, individuals establish patterns of behaviour that can profoundly influence their health and overall wellbeing. This period is pivotal as it lays the groundwork for future physical, cognitive, emotional, social, and economic aspects of life (Newman & Newman, 2012).

Research suggests that hedonia, and eudaimonia in particular, are associated with positive psychosocial development, and are protective against depression and other negative outcomes (Gentzler et al., 2021; Jia et al., 2022; Telzer et al., 2014). Moreover, engaging in eudaimonic behaviours during adolescence has been found to be linked to greater emotional competence in early adulthood, and to lower

levels of anxious and depressive symptoms at that stage (Hallam et al., 2014).

Eudaimonia, which may represent the ultimate outcome of adolescent wellbeing, was explored in a recent study by Russo-Netzer and Tarrasch (2024). Their findings suggested that adolescents' life satisfaction doesn't come from seeking pleasure or transient enjoyable feelings. Rather, it stems from engaging in activities and circumstances that contribute to their sense of purpose and are oriented toward their future development and growth. However, they also noted that an excessive focus on future-oriented thinking could divert adolescents' attention from finding meaning and satisfaction in their current experiences. They explained that fixating too much on the future can lead to anxiety, feeling overwhelmed by uncertainty, and perceiving potential threats as immediate and escalating. These reactions can trigger negative emotions and stress, ultimately impacting overall wellbeing negatively.

The school community, including parents, should recognize the importance of promoting student wellbeing. This involves not only addressing the immediate hedonic needs of adolescents but also their eudaimonic needs by supporting extracurricular activities that fulfill their deeper sense of purpose and fulfillment, without over-emphasizing future directions. Interventions targeting eudaimonic growth during adolescence could potentially enhance emotional competence and mental health as individuals transition into adulthood.

Data Avilability

The data that support the findings of this study are available on request from the corresponding author, GS. The data are not publicly available due to ethical requirements.

Appendix

See Tables 3, 4.

See Figs. 14, 15.

Table 3 Number of participants from each country

Participants			Questionnaire language
Country	Frequency	Percent	
Australia	675	8.6	English
Chile	1701	21.8	Spanish
Greece	361	4.6	Greek
India	745	9.5	English
Indonesia	747	9.6	Bahasa
Israel	49	0.6	Hebrew
Italy	58	0.7	Italian
Malta	450	5.8	Maltese
Mexico	1308	16.8	Spanish
Poland	440	5.6	Polish
Portugal	161	2.1	Portuguese
Russian Federation	435	5.6	Russian
Spain	520	6.7	Spanish
Turkey	71	0.9	Turkish
United States of America	87	1.1	English
Total	7808	100	

Table 4 Participants' time in lockdown

Country	Time in lockdown (days)		
	Mean time (days) in lockdown (*SD*)	Median time (days) in lockdown	Range (days)
Australia	42.63 (36.3)	28	0–276
Chile	140.0 (47.7)	150	0–300
Greece	68.5 (36.8)	62.5	0–200
India	80.67 (20.7)	88	2–200
Indonesia	91.47 (50.9)	90	2–270
Israel	51.56 (19.1)	60	0–90
Italy	79.72 (17.8)	82.5	50–125
Malta	86.3 (28.0)	90	0–167
Mexico	114.9 (64.9)	90	0–200
Poland	76.1 (29.3)	90	0–200
Portugal	83.3 (27.6)	90	1–150
Russian Federation	68.3 (27.0)	70	0–190
Spain	84.5 (30.3)	90	0–240
Turkey	94.4 (43.8)	90	0–180
United States of America	71.0 (21.3)	69.5	0–160
Total	96.13 (53.1)	90	0–300

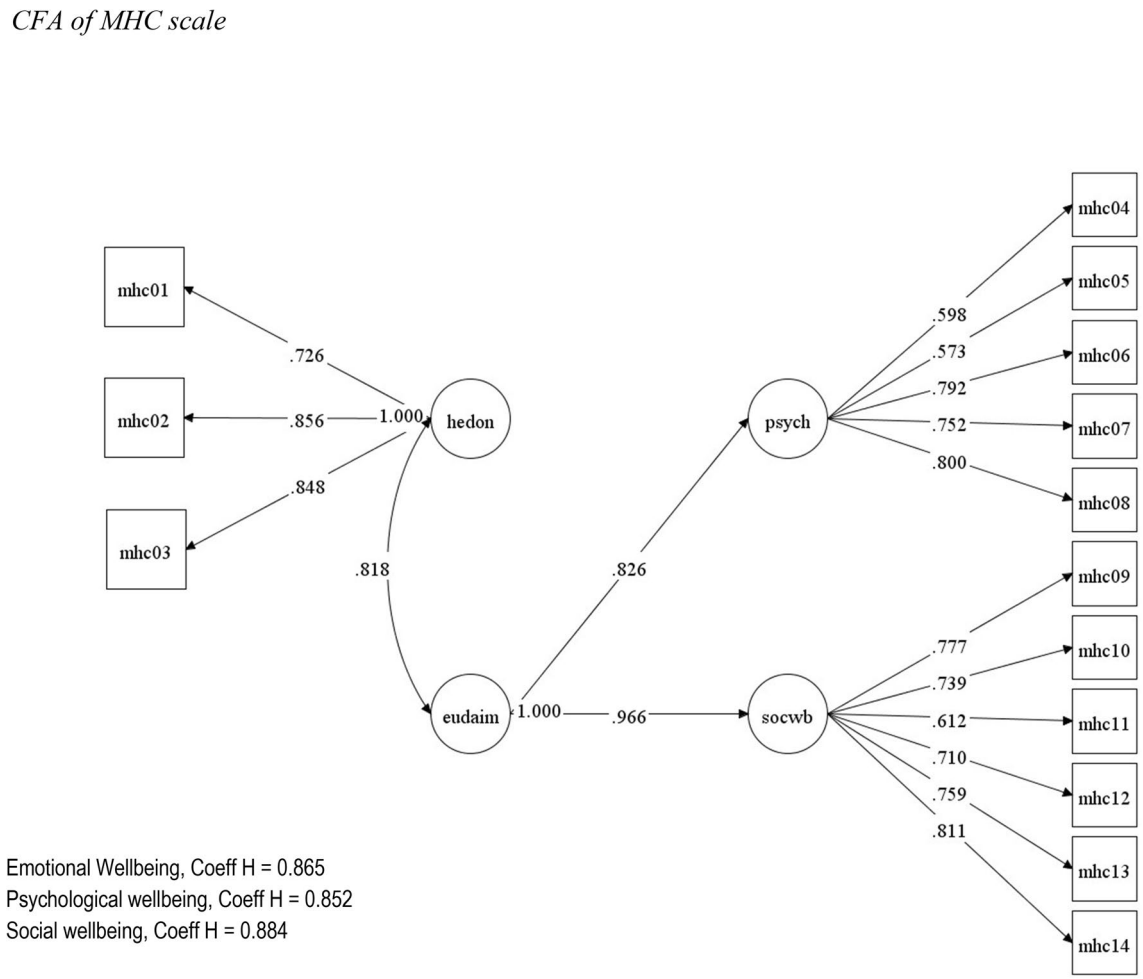

Fig. 14 CFA of MHC scale

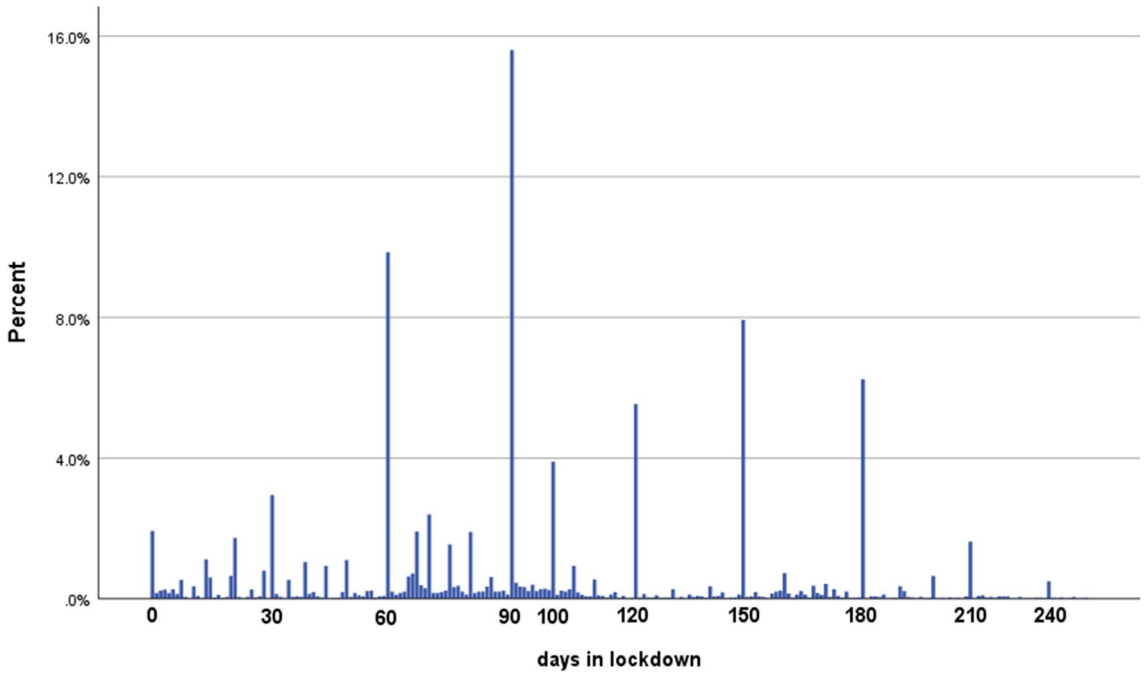

Fig. 15 Participants' self-reported time in lockdown

Author Contributions Authors provided in-kind support and contributed to the study design, data collection, and manuscript text. The lead author coordinated the study, data analysis, and writing of the manuscript text.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions. There was no monetary funding for this study. Resources for data collection were provided by authors' tertiary institutions and research centers.

Declarations

Conflict of interest The authors have declared that they have no competing or potential conflicts of interest.

Ethical Approval This study was approved by the Flinders University Human Research Ethics Committee #7077, 28 April, 2020. Authors in different locations also sought ethics approval from their local jurisdictions, and aligned study conduct with the ethical requirements of Flinders University Human Research Ethics Committee. This included parental consent for minors under 18 years of age.

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