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UNIversity students' LIFEstyle behaviours and Mental health cohort (UNILIFE-M): study protocol of a multicentre, prospective cohort study

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ABSTRACT

Introduction Students enrolling in higher education often adopt lifestyles linked to worse mental health, potentially contributing to the peak age onset of mental health problems in early adulthood. However, extensive research is limited by focusing on single lifestyle behaviours, including single time points, within limited cultural contexts, and focusing on a limited set of mental health symptoms.

Methods and analysis The UNIversity students' LIFEstyle behaviours and Mental health cohort (UNILIFE-M) is a prospective worldwide cohort study aiming to investigate

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The study includes a large sample of students from multiple countries across five continents.
⇒ A wide range of lifestyle behaviours and mental health symptoms are evaluated.
⇒ Lifestyle behaviours and mental health symptoms are assessed using self-reported questionnaires.
⇒ Retention rates for follow-up assessments may be low.

the associations between students' lifestyle behaviours and mental health symptoms during their college years. The UNILIFE-M will gather self-reported data through an online survey on mental health symptoms (ie, depression, anxiety, mania, sleep problems, substance abuse, inattention/hyperactivity and obsessive/compulsive thoughts/behaviours) and lifestyle behaviours (ie, diet, physical activity, substance use, stress management, social support, restorative sleep, environment and sedentary behaviour) over 3.5 years. Participants of 69 universities from 28 countries (300 per site) will be assessed at university admission in the 2023 and/or the 2024 academic year and followed up for 1, 2 and 3.5 years.

Ethics and dissemination The study was first approved at a national level in Brazil (CAE:63025822.8.1001.5346). Study sites outside Brazil obtained additional ethics approval from their institutions using the main approval. Results from the UNILIFE-M cohort will be disseminated through scientific publications, presentations at scientific meetings, press releases, the general media and social media.

BACKGROUND

The transition to university involves significant shifts in social, academic and financial demands.[1 2] Adapting to these new challenges requires a reorganisation of lifestyle routine and behaviours.[3] Previous studies support that the transition to university influences multiple lifestyle behaviours, showing that university students often exhibit high levels of physical inactivity[4] and sedentary behaviour,[5] poor and unbalanced diets,[3] high rates of alcohol and substance misuse,[6] poor sleep patterns[7] and increased screen time.[8]

Lifestyle behaviours are modifiable risk factors for the development of mental health symptoms.[9] High levels of physical inactivity, poor diet, poor sleep quality, substance misuse and excessive screen exposure are associated with an increased risk of mental health symptoms.[10–18]

Mental health symptoms and disorders are highly prevalent worldwide, in all populations, including university students. According to the World Mental Health Report Update 2024 by the WHO, approximately one in every seven people globally (15–18%) lives with a mental disorder at any given time, representing around 1.3 billion individuals. Depression and anxiety are the most frequent conditions, and the global burden of mental disorders has continued to increase over the past decade, largely affecting younger age groups. The Lancet Psychiatry Commission (2024) estimated that mental health disorders account for about US$ 6 trillion in economic losses annually, due to healthcare costs, reduced productivity and social exclusion, a figure projected to rise to US$ 8.5 trillion by 2030. [19–21]Among university students, the prevalence of mental health problems has reached alarming levels. A recent meta-analysis including data from over 90 000 students across 37 countries reported pooled prevalence rates of 27% for depressive symptoms, 23% for anxiety and 19% for stress-related symptoms, with higher figures in low- and middle-income countries.[22] A global study conducted in 2024 by the Healthy Minds Network found that nearly 44% of students met criteria for at least one mental health condition, and only one-third reported having received adequate psychological support.[23] Also, the transition period to higher education coincides with the peak onset age for most psychiatric disorders (18–35 years), reinforcing the importance of prevention strategies in this population.[24] However, most studies to date have only examined the relationship between individual lifestyle behaviours and mental health symptoms (eg, sleep and depression).[10–18]

Lifestyle behaviours frequently co-occur in clusters rather than in isolation.[11–25] Among university students, higher levels of physical activity are associated with better dietary habits and lower smoking rates.[26 27] Conversely, higher physical activity levels may also coincide with increased alcohol consumption,[28] while sedentary behaviour is linked to poor sleep but not smoking.[29] Given the nature of these behaviour clusters, it is plausible that assessing multiple lifestyle behaviours simultaneously could offer a more comprehensive and person-centred approach to understanding the associations between lifestyle and mental health symptoms.[30]

Some evidence suggests that clusters of lifestyle behaviours are associated with mental health outcomes among university students.[31–37] In a study of Australian students,[31] four distinct clusters were identified: 'healthiest', 'healthy', 'mixed' and 'sedentary and distressed'. The 'healthiest' cluster (characterised by higher levels of physical activity and fruit consumption, lower binge drinking and the least sedentary behaviour) was associated with the lowest levels of depression, anxiety and stress compared with the other clusters. Another study of Australian students identified three clusters: 'healthier', 'moderate'" and 'unhealthier' lifestyles, with the latter two being linked to higher psychological distress risks.[38] Among Chinese students,[37] four clusters were found: (1) active pattern (those with higher levels of physical activity); (2) high sleep duration pattern; (3) high screen time pattern; and (4) low physical activity/low sleep duration pattern. The study concluded that students with low physical activity and low sleep duration faced a higher risk of depressive symptoms. Nevertheless, most of the previous evidence is based on cross-sectional studies, providing no insight into the temporality of the associations.

The Seguimiento Universidad de Navarra (SUN) cohort is one of the few prospective studies showing that students who adhered to ten healthy lifestyle behaviours, termed the 'healthier lifestyle' cluster (eg, smoking cessation, physical activity, healthy diet, appropriate body mass index, moderate alcohol consumption, low television exposure, avoidance of binge drinking, regular naps, social interaction and work engagement), had a 32% lower risk of developing depression compared with those reporting three or fewer healthy behaviours.[39] However, this evidence is limited to depression, hindering the generalisation of findings to other mental health symptoms.

Lifestyle behaviours and mental health symptoms are influenced by contextual factors, such as cultural and

social influences.[40 41] Some literature suggests that certain lifestyle behaviours universally protect against mental health issues,[15 42] while the association of others may be context specific. For example, physical activity universally protects against depression and anxiety, with little variation in effect size across geographic regions.[15 42] In contrast, alcohol consumption is linked to positive mental health and lower rates of depression, anxiety and stress among German students, while it is associated with higher rates of these symptoms in Chinese students.[42] This evidence comes from only two countries and focuses on a limited set of lifestyle behaviours (physical and mental activity, alcohol consumption, smoking, circadian and social regularity). More studies across multiple countries, examining a broader range of lifestyle behaviours, are needed to clarify both universal and country-specific associations.

Both lifestyle behaviours and mental health vary throughout university years. Data from the Household, Income and Labour Dynamics in Australia (HILDA) study demonstrated that mental health follows a fluctuating course in Australian students.[43] This cohort showed that young university students experienced a decline in mental health from ages 16 to 17, followed by an improvement from ages 17 to 18, a decline again from ages 19 to 20, and then an improvement from ages 20 to 21. A UK study similarly identified four distinct mental health trajectories: persistently high-severity symptoms, fluctuating symptoms opposing national trends, fluctuating symptoms consistent with national trends and persistently low-severity symptoms.[44] Lifestyle behaviours also appear to follow varying trajectories over time.[45 46] However, there is a lack of prospective studies investigating the associations between lifestyle behaviours and mental health trajectories in large cohorts of university students.

To address the gap in prospective research on the relationship between multiple lifestyle behaviours and mental health symptoms in a diverse international cohort of university students, the UNIversity students' LIFEstyle and Mental health (UNILIFE-M) study was conceived. The UNILIFE-M cohort is a large, multicentre, international, prospective cohort study aiming to provide a comprehensive view of the dynamic relationships between multiple lifestyle behaviours (including physical activity, sedentary behaviour, diet, stress management, sleep, substance use, exposure to green environments and social support) and a wide range of mental health symptoms (including depressive, anxiety, manic, obsessive-compulsive, psychotic, attention-deficit/hyperactivity symptoms, substance abuse and suicidal ideation), either independently or in clusters, among university students worldwide.

METHODS

Study design

The UNILIFE-M is a multicentre, international, prospective cohort study. The study will be conducted in 67 universities in 28 countries. Of these, 48 study sites from 19 countries started data collection in 2023. The study report follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[47]

Recruitment

The baseline recruitment and assessments will occur during the beginning of the academic calendar in 2023 and 2024, with three follow-ups: 1, 2 and 3.5 years following the baseline. The recruitment will be closed by 2028. The exact month of the study commencement will vary according to the beginning of the academic year in each specific study site. Through a convenience sampling procedure, students will be recruited using online resources, such as advertising on social media (eg, Twitter, Instagram and Facebook) and through university website/course-specific sites, and direct emails, following relevant data privacy laws and policies in the respective countries and institutions. Newsletters and posters can be fixed on the university walls with the link/QR code to the study survey, depending on ethics regulations. Lastly, face-to-face invitations through flyers were distributed to students in gathering places such as university restaurants, parks, university student services or during lectures.

Follow-ups

For the follow-up, participants will be directly contacted via email, and, whenever indicated by the participant and following ethics regulations, via text messages on social media. The use of participant compensation (eg, going into a prize draw to receive an e-gift card on completion of surveys at each time point) is permitted but not mandatory for all study sites. Given the breadth of countries and contexts and ethics regulations involved in UNILIFE-M, the use of participant compensation is to be determined as appropriate by each study site.

Participants

Inclusion criteria for the study are as follows: (1) aged 16–35 years that includes the age range of those at a higher risk for incident mental health problems[24] and (2) enrolled as a freshman (ie, in the first semester of an undergraduate course) in the 2023 or 2024 academic year at a participating UNILIFE-M university. Participants of all courses and fields are eligible.

Outcomes and assessments

The prospective study will evaluate lifestyle behaviours, mental health symptoms and demographics. Questionnaires not available in the language of the participating study sites will be translated and back-translated according to previous guidelines for translating questionnaires.[48]

Lifestyle

The lifestyle assessments include the domains proposed by the American College of Lifestyle Medicine[49]: diet and nutrition, substance misuse, physical activity, stress management, restorative sleep, social support and environmental exposures and will be assessed by two instruments, the Short Multidimensional Inventory Lifestyle

Evaluation for University Students (U-SMILE)[50] and two questions on sedentary behaviour.[51]

The Short Multidimensional Inventory Lifestyle Evaluation for University Students (U-SMILE)

The U-SMILE is a variation of the self-reported SMILE questionnaire,[27 50] developed with pilot data of this cohort, collected between June-December 2022. The original SMILE scale has 43 items, while the U-SMILE comprises 24 items evaluating seven domains (diet and nutrition, substance use, physical activity, stress management, restorative sleep, social support and environmental exposures). The items ask about the frequency of lifestyle behaviours in a regular week over the last month (always, often, seldom or never). The original U-SMILE is a shortened version of the SMILE, as we observed that a significant proportion of participants dropped out while responding to the survey in a pilot sample of the present study. Scores of the U-SMILE range from 0 to 96; higher scores mean a healthier lifestyle for that domain.[27 50] The U-SMILE is currently available in Brazilian Portuguese, Spanish and English and will be translated into all languages of the participating study sites. The scale has demonstrated acceptable internal consistency (Cronbach's α=0.73, McDonald's ω=0.79) in the pilot study sample.[50]

Sedentary behaviour

The sedentary behaviour assessment includes two questions, one measuring the average amount of time spent sitting and another measuring the time spent lying down or in a reclined posture. The scale response was provided in five categories: less than 3 hours/day; from 3 hours to less than 6 hours/day; from 6 hours to less than 8 hours/day; from 8 hours to less than 12 hours/day; more than 12 hours/day. The question on sitting time has demonstrated acceptable validity and reliability.[51]

Mental health symptoms

Mental health symptoms in the cohort study will be assessed at two levels. At the first level, the Level 1 Cross-Cutting Symptom Measure for Adults Diagnostic,[52] proposed by the Diagnostic and Statistical Manual of Mental Disorders - 5 (DSM-5), will be answered by all participants. Respondents with a positive screening at the level 1 instrument for depression, mania, anxiety, sleep, obsessive and compulsive behaviours, or alcohol/substance abuse will be directed to a level 2 instrument for that problem. There will be no level 2 instrument for anger, somatic symptoms, psychosis, memory problems, dissociation or personality, as suggested by the cross-sectional DSM-5 tool. Attention deficit and hyperactivity symptoms are not assessed in the level 1 cross-cutting tool, so all participants will respond to the Adult Self-Report Scale (ASRS) – Shortened version at level 1.[53]

The DSM-5 Level 1 Cross-Cutting Symptom Measure for Adults

The DSM-5 Level 1 Cross-Cutting Symptom Measure for Adults is a self-reported questionnaire that assesses important domains across most psychiatric diagnoses.[54] The adult version comprises 23 questions that assess 13 psychiatric domains: depression, anger, mania, anxiety, somatic symptoms, suicidal ideation, psychosis, sleep problems, memory problems, repetitive thoughts and behaviours, dissociation, personality functioning and substance use. The frequency of experiencing associated symptoms is assessed using a 5-point Likert scale in which participants will respond about how much (or how often) they have been bothered by a given problem during the past 2 weeks. Responses range from 0 (none/not at all) to 4 (severe/nearly every day). A score of 2 (mild or several days) or greater on any item within a domain is considered a positive screen, except for substance use, suicidal ideation and psychosis, for which a positive screen is considered when a participant scores 1 (slightly or rare, less than a day or two). Subjects with a positive screening at level 1 will answer the level 2 instruments. The DSM-5 Level 1 Cross-Cutting Symptom Measure for Adults has been shown to be a valid and reliable tool for evaluating mental health symptoms in university students.[55] The cut-off per domain and the subsequent level 2 instrument are seen in table 1.

Depressive symptoms

Depressive symptoms will be assessed using the Patient Health Questionnaire (PHQ-9). The PHQ-9 is a 9-item self-reported questionnaire that evaluates the presence of depressive symptoms, defined according to the DSM criteria over the last 2 weeks.[56] The PHQ-9 scale showed excellent internal reliability (Cronbach's α=0.89–0.86).[57] The scoring ranges from 0 to 27, and higher scores indicate higher symptom severity. Participants scoring 10 or higher will be considered caseness for depression.[56 57]

Hypomanic/manic symptoms

Hypomanic/manic symptoms will be assessed with the hypomania checklist (HCL-16). The HCL-16 is a 16-item self-report questionnaire that evaluates hypomanic and manic symptoms, with acceptable reliability (Cronbach's α=0.77).[58] Scores range from 0 to 16, with higher scores indicating higher severity of manic symptoms, and scores higher than 7 will be considered caseness for manic symptoms.[59]

Anxiety symptoms

Anxiety symptoms will be assessed with the Generalised Anxiety Disorder questionnaire (GAD-7),[60] a 7-item self-report questionnaire evaluating the presence of the core symptoms of generalised anxiety, with excellent reliability (Cronbach's α=0.92).[60] Scores range from 0 to 21; higher scores indicate increased anxiety symptoms and scores equal to or greater than 10 indicate caseness for anxiety.[60]

Sleep disturbances

The Pittsburgh Sleep Quality Index (PSQI) comprises 19 self-reported items assessing sleep quality and disturbances, with good reliability (Cronbach's α=0.83).[61] In the current project, we are using the ten items of the

Table 1 Level 1 cut-offs per domain and subsequent level 2 instruments

Domain	Cut-off	Level 2 scale
Depressive symptoms	≥2	Patient Health Questionnaire (PHQ-9)
Anger	≥2	–
Hypomanic/manic symptoms	≥2	Hypomania CheckList-16 (HCL-16)
Anxiety symptoms	≥2	Generalised Anxiety Disorder (GAD-7)
Somatic symptoms	≥2	–
Suicidal ideation	≥1	–
Psychosis	≥1	–
Sleep problems	≥2	Pittsburgh Sleep Quality Index (PSQI) – Sleep problems domain
Memory	≥2	–
Obsessive and compulsive symptoms	≥2	Obsessive-Compulsive Inventory (OCI-R)
Dissociation	≥2	–
Personality	≥2	–
Substance use	≥1	Alcohol Smoking and Substance Involvement Screening Test (ASSIST) – Frequency of use items
Inattention/hyperactivity*	≥4	Adult Self-Report Scale (ASRS) – Long form

Slight and mild symptoms correspond to 1 and 2 points on the scales, respectively.
*Level 1 instrument for inattention/hyperactivity is the Adult Self-Report Scale (ASRS) shortened version, with six items.

sleep disturbances domain. The sum of scores generates a global score ranging from 0 to 21. Higher scores indicate sleep disturbances, and scores greater than 5 are caseness for sleep problems.[61]

Obsessive and compulsive symptoms

The Obsessive-Compulsive Inventory (OCI-R) comprises 18 self-reported items that evaluate the impact of obsessive and compulsive symptoms on daily life, with good reliability (Cronbach's α=0.81).[62] The scores range from 0 to 72, and higher scores reflect higher symptom severity, with a score of 21 or higher indicating caseness for obsessive-compulsive symptoms.[62]

Alcohol and substance use

The use of alcohol and other substances will be evaluated using the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST).[63] The ASSIST has eight items assessing the frequency, related problems, stop attempts and risk and compulsive behaviours associated with the use of tobacco, alcohol, cocaine, marijuana, amphetamine stimulants, sedatives, inhalants, hallucinogens, opioids and other drugs. The current study will assess the frequency of used substances.[63] The instrument showed acceptable to excellent reliability for each substance (Cronbach's α ranging from 0.73 for tobacco use to 0.92 for alcohol use).[63]

Attention deficit and hyperactivity symptoms

Attention deficit and hyperactivity symptoms will be assessed using the Adult Self-Report Scale (ASRS) for screening for attention deficit and hyperactivity disorder.[64] The instrument presents acceptable reliability (Cronbach's α: 0.63–0.72).[64] The shortened version with six items will be used for initial screening at level 1, and those above the cut-off (scoring≥4) will answer the full scale (level 2) composed of 12 additional items (ie, 18 items in total).[65] The cut-off for caseness for the full scale is 16 or higher.

Sociodemographic characteristics

Participant sociodemographic characteristics will be assessed, including age, sex, pregnancy (for women), gender identity, sexual orientation, height, weight, marital status, residency, occupation, household income, previous mental health diagnosis and treatments, physical conditions, COVID-19 infections, the university enrolled at and study subject.

University-specific (study-site) information

We will collect details, for each study site, on the strategies used for participant recruitment (eg, in-person, online or both), whether participant compensation was used and, if so, what type (financial, academic credit, vouchers, etc) of participant compensation and the total number of students entering the university at that period, as well as the age and gender distribution of enrolled students.

Sample size estimation

For a latent growth model, a sample size of n=150 is sufficient to reliably detect lifestyle behaviours and mental health trajectory associations (ie, among slopes and/or intercepts with a moderate effect size of d=0.5), with a power=80% in four time points, and to test associations between trajectories, for an alpha level of 0.05. According to the current literature,[66] we expect a 50% attrition rate

for the 3.5-year follow-up, so the sample size, accounting for attrition, is estimated at n = 300. The sample size corresponds to the minimum per study site.

Statistical analyses

Statistical analyses include descriptive measures such as mean and SD and relative and absolute frequencies. Mental health problem's prevalence and incidence will be calculated. The associations between trajectories will be tested using latent growth curve models (LGCMs). Multilevel models may be adopted to control the cluster effect of countries and/or universities. All models will include mental health problems as categorical and lifestyle behaviours as continuous variables. First, univariate LGCMs will be fitted independently to each mental health problem and lifestyle behaviour as a function of time. Univariate LGCMs allow for an examination of (1) the initial level of a target outcome (ie, intercept), (2) its rate of change (ie, slope) and the form of this change (ie, linear or nonlinear latent growth trajectory) and (3) the association between the outcome at baseline and its rate of change over time. The intercept of each target outcome (mental health symptoms and lifestyle behaviours) will be centred at baseline, and a latent growth trajectory (ie, linear or nonlinear latent growth trajectory) will be tested. Intercepts and slopes of all target outcomes will be adjusted for baseline age (in years), gender and country (for the cross-country analysis). After establishing the latent growth trajectories and ensuring a good model fit in univariate LGCMs, cross-domain LGCMs will be performed to examine the association between each mental health symptom trajectory and lifestyle behaviours. To understand the relationship between specific lifestyle measured continuously and psychopathology measured at three time points, random intercept cross-lagged panel models (RI-CLPM) will be used. This model can differentiate the trait-level relationship between lifestyle and mental health symptoms and the relationship between changes in their levels.[67]

On top of the parameters estimated in univariate LGCMs, cross-domain LGCMs will assess associations between (1) baseline mental health symptoms and baseline lifestyle behaviours, (2) baseline lifestyle behaviours and the rate of change in mental health symptoms and (3) the rate of change in mental health symptoms and the rate of change in lifestyle behaviours. These models will be adjusted for baseline age (in years), sex and country (for the cross-country analyses). Sensitivity LGCM analyses will investigate the association between mental health symptoms and lifestyle in the context of adjustment for potential confounders such as age and gender. Models including cross-country data may be weighted for the sample size in each country to control for the unbalanced number of study sites per country. Models including data from a single country will be weighted for the achieved sample size in each study site. Missing data will be tested for randomness. To understand the pattern of possible missing data (missing completely at random, missing at random, missing not at random), and the possibility of biased estimates, Little's MCAR is to be performed. If significant, the assumption that data are missing completely at random should be rejected. Multivariate imputation by chained equations will be used for multivariate imputations.

The prevalence of mental health diagnoses will be corrected by considering the sensitivity and specificity of the screening test properties by applying Bayesian adjustment to correct apparent prevalence estimates.[68 69]

Patient and public involvement

The UNILIFE-M study was codesigned with the target population. Participants assisted in developing the study design and instrument selection.

Ethics and dissemination

The UNILIFE-M study procedures comply with the principles of the Declaration of Helsinki. All participants are to provide electronically signed informed consent prior to completing the survey. Data will be pseudonymised to ensure participants' privacy and managed in accordance with data protection regulations, including the *Lei Geral de Proteção de Dados* (LGPD), as the data will be stored in Brazil. Participants retain the right to withdraw at any time. At study sites where required by local regulations, students reporting mental health symptoms may be referred to specialised mental health services.

The study received ethical approval and was registered with the Brazilian Ethics Committee (CAE: 63025822.8.1001.5346). Study sites outside Brazil relied on the major project to obtain additional institutional ethics approvals, in accordance with local regulations. All participating sites are supported by local, regional or national ethical approvals. A detailed list of the ethics approval numbers for each study site is provided in online supplemental material.

Results from the UNILIFE-M project will be disseminated through scientific publications, presentations at scientific meetings, press releases, the general media and social media. The project aims to generate at least two main papers merging data from all the included countries/territories/regions, one with cross-sectional data just after the 2024 baseline assessments and one after study completion, with data from all follow-ups. Additional study dataset analyses (focusing on one or two specific disorders, lifestyle behaviours or countries/regions) may be performed under preregistration with the study coordinators.

DISCUSSION

Social and scientific strengths

The UNILIFE-M cohort study is a unique opportunity to understand the relations between multiple lifestyle behaviours and mental health problem trajectories among university students in a large international cohort, including low-, middle- and high-income countries. The main strengths of this study are (1) a comprehensive

assessment of lifestyle behaviours, focusing on seven behaviours according to the current, official definitions of lifestyle,[49] (2) the evaluation of time trajectories of both lifestyle and mental health issues at multiple time points throughout the college years, (3) the assessment of a wide range of mental health symptoms that are highly prevalent in this age group and (4) a large sample size cohort with students from 69 universities located in 28 different countries worldwide including diverse cultures and socioeconomic contexts. With the UNILIFE-M, we can provide insights on the universal and country/regional-specific lifestyle and mental health trajectories in university students and how these outcomes are associated.

Limitations

It should be acknowledged that some degree of heterogeneity in recruitment procedures is expected, given the cultural and organisational differences between universities worldwide and local ethical regulations. For example, in some cultures, compensation for research participation is usually expected, but in other countries, such as Brazil, compensation for research participants is not allowed by law. The use and type of compensation, and the convenience sampling used may make a study site more prone to sampling and response bias, and self-selection bias, which are common limitations of most studies based on web surveys. Second, the study primarily focuses on self-reported measures, which are more likely to suffer from recall problems and social desirability biases. Despite this, we selected instruments broadly used and validated in multiple countries and languages. Further, the use of self-reported questionnaires may be prone to measurement errors and cannot replace clinical interviews to diagnose mental disorders. However, online surveys further enable data to be collected from a broader range of countries, particularly those with limited resources, which is imperative to ensuring inclusiveness. There might be further issues with low response rates, loss of participants and high dropout rates. Furthermore, it can be that some students finish their university career after 3 years (involving a transition to working life). In contrast, the last follow-up in our study is after 3.5 years.

Given that transitioning to higher education is generally characterised by both the onset of mental health symptoms and engaging in poorer health/lifestyle behaviours, global efforts must be made to comprehensively understand how multiple lifestyle behaviour trajectories relate to mental health symptoms in university students worldwide. The findings of UNILIFE-M will be used to help inform the development of policies and programmes to better support university students' mental health and lifestyle behaviours internationally.

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