Data Article

Dataset on thermal comfort, perceived stress, and anxiety in university students under confinement due to COVID-19 in a hot and humid region of Mexico

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\textbf{ABSTRACT}

This dataset was compiled to estimate the levels of thermal comfort and mental health in a sample group of university students confined due to the COVID-19 pandemic. By the time research was carried out, these students of a hot and humid region of Mexico, had already spent 200 days on distance learning using online platforms. A total of 324 records were documented with a final sample of 316 valid participants. The total records were collected directly from the students through a web platform (Microsoft forms). This data set can be used to generate correlations between mental health, thermal comfort, and individual characteristics in the study population that will allow to identify the influence of the built environment and local climate on the levels of stress and anxiety that university students experienced un-
Specifications Table

| Subject                  | Engineering, psychology. |
|--------------------------|--------------------------|
| Specific subject area    | Thermal comfort, mental health, university students. |
| Type of data             | Text, Table, Graph, Excel file. |
| How the data were acquired | A survey was used to collect data, which included a questionnaire of personal information (to obtain the sociodemographic information, school data, Internet connection, and health characteristics); Adaptation of the Questionnaire of Indoor Thermal Environments; The Scale of Stress Perceived of Cohen PSS-14; and Beck Anxiety Inventory (BAI). This survey was applied online on the platform Microsoft Forms and subsequently exported into its Excel file (.xls) version for processing. |
| Data format              | Raw and analyzed. |
| Parameters for data collection | The study population consisted of students from a public university. The data was collected during the first month of the academic period February – July 2021. The students were using the online learning platforms throughout this semester due to the ongoing coronavirus pandemic (COVID-19). |
| Description of data collection | A web-based questionnaire on thermal comfort and mental health was developed on the online survey platform Microsoft Forms and promoted through the social networks of a university community. In addition, the online questionnaire was given to different professors who were asked to distribute the questionnaire’s link to their students. |
| Data source location     | A public University (protecting the confidentiality of the institution) City: Coatzacoalcos, Veracruz Country: Mexico |
| Data accessibility       | Dataset has been uploaded on Mendeley Repository name: Mendeley repository Direct URL to data: https://data.mendeley.com/datasets/hp7knm4zp9/3 DOI: 10.17632/hp7knm4zp9.2 |
| Related research article | N/A. |

Value of the Data

- The dataset will be useful to analyze the correlations between thermal comfort and mental health of university students facing COVID-19 confinement.
- The dataset can be used to identify the different comfort and discomfort profiles through thermal sensation assessment and health information.
- The dataset will be useful for researchers willing to compare the results against similar data from other regions of the world.
- The dataset will be useful to establish a precedent for COVID-19-derived effects on the thermal responses of individuals.
- The dataset will be useful for researchers who want to describe aspects of health and mental health in university students under confinement.
- The dataset contributes to predict the influence of environmental aspects on mental health in a confinement setting.
1. Data Description

The World Health Organization declared the COVID-19 outbreak a public health emergency of international concern on January 30, 2020, since it has spread worldwide, affecting a large number of people [1]. According to the United Nations Educational and Cultural Organization (UNESCO), one year after the onset of the COVID-19 pandemic, almost half of the world’s learners continued to be affected by the partial or total closure of schools [2]. Regarding health effects, studies such as that of Ozamiz et al [3], mention high levels of stress and anxiety in the first phase of the COVID-19 outbreak; severe and extremely severe levels of stress and anxiety were reported in the population, with the 18-to-25 age group having the highest prevalence of extremely severe levels. Likewise, considering confinement as the obligation to remain in their homes, environmental conditions become a factor that should be considered as a mediator in the behavior and health of the individual.

This dataset contains data for the estimation of thermal comfort levels (thermal and humidity) and mental health (stress perceived and anxiety) in a group of university students in the South of Mexico, with ages between 18 and 43 years old and an average of 20. The data was collected through a web platform (Microsoft Forms) where anonymous users answered each question. Then, the information was processed obtaining 316 records (172 females and 144 males) and 2 independent sets: the first set refers to thermal comfort and the second set to mental health, respectively. The surveys were generated and analyzed based on the scales suggested by the original authors of the instruments. The raw data is in Mendeley dataset which can be accessed through the following link: https://data.mendeley.com/datasets/hp7knm4zp9/3

The data about the sociodemographic status, school, internet connection, and health aspects were aimed to characterize the study population. It contained: gender, age, marital status, number of cohabitants, perception of the relationship with cohabitants (Table 1); internet access, type of internet connection, quality of internet connection (Table 2), diagnosed physical and/or mental illnesses (Table 3); consumption of psychoactive substances (alcohol, tobacco, cannabis, cocaine, non-prescription drugs, coffee, energy drinks) (Table 4); aspects related to health lifestyles (hours of sleep, number of meals per day, number of hours dedicated to physical

| Table 1                                                                 | Data                                      | Relative frequency (f) | Absolute frequency (%) |
|------------------------------------------------------------------------|-------------------------------------------|------------------------|------------------------|
| Gender                                                                 | Male                                      | 144                    | 45.6                   |
|                                                                        | Females                                   | 172                    | 54.4                   |
| Age                                                                    | 18–23                                     | 289                    | 91.5                   |
|                                                                        | 24–28                                     | 20                     | 6.3                    |
|                                                                        | 29–33                                     | 5                      | 1.6                    |
|                                                                        | 34–38                                     | 1                      | 0.3                    |
|                                                                        | 39–43                                     | 1                      | 0.3                    |
| Marital status                                                         | Unmarried                                 | 311                    | 98.4                   |
|                                                                        | Married                                   | 3                      | 0.9                    |
|                                                                        | Divorced                                  | 1                      | 0.3                    |
|                                                                        | Free union                                | 1                      | 0.3                    |
| Number of partners                                                     | 0–3                                       | 189                    | 59.8                   |
|                                                                        | 4–6                                       | 122                    | 38.6                   |
|                                                                        | 7–9                                       | 3                      | 0.9                    |
|                                                                        | 10–12                                     | 1                      | 0.3                    |
|                                                                        | 13–15                                     | 1                      | 0.3                    |
| Perception of the relationship with partners                           | Good                                      | 236                    | 74.7                   |
|                                                                        | Regular                                   | 80                     | 25.3                   |
|                                                                        | Poor                                      | 0                      | 0                      |
Table 2
Data referring to the internet connection in the face of confinement for COVID-19.

| Data                        | Relative frequency (f) | Absolute frequency (%) |
|-----------------------------|------------------------|------------------------|
| Internet Access             |                        |                        |
| No                          | 16                     | 5.1                    |
| Yes                         | 300                    | 94.9                   |
| Connection type             |                        |                        |
| Mobile data                 |                        |                        |
| Home wireless network (Wi-Fi) | 283                   | 89.6                   |
| Public place wireless (Wi-Fi) network | 3                    | 0.9                    |
| Wired network at home       | 9                      | 2.8                    |
| Internet connection quality |                        |                        |
| Good                        | 73                     | 23.1                   |
| Regular                     | 193                    | 61.1                   |
| Poor                        | 50                     | 15.8                   |

Table 3
Medically diagnosed physical and mental illnesses.

| Diseases                                | Presence | Absence |
|-----------------------------------------|----------|---------|
| Physical                                |          |         |
| Mellitus diabetes                       | 1        | 315     |
| Arterial hypertension                   | 4        | 312     |
| Sexually transmitted infections         | 1        | 315     |
| Disability                              | 16       | 300     |
| Other physical illness                  | 27       | 289     |
| Mental                                  |          |         |
| Schizophrenia                           | 1        | 315     |
| Major depression syndrome               | 7        | 309     |
| Generalized anxiety disorder            | 32       | 284     |
| Another mental illness                  | 11       | 305     |

Note: f - relative frequency; % - absolute frequency.

Table 4
Data regarding the consumption of psychoactive substances before confinement for COVID-19.

| Psychoactive substances | Consumption | Do not consume |
|-------------------------|-------------|----------------|
| Alcohol                 | 90          | 226            |
| Tobacco                 | 34          | 282            |
| Cannabis                | 12          | 304            |
| Cocaine                 | 1           | 315            |
| Non-prescription drugs  | 22          | 294            |
| Coffee                  | 233         | 83             |
| Energy drinks           | 83          | 233            |

Note: f - relative frequency; % - absolute frequency.

activity per week) (Table 5); aspects related to environmental conditions and thermal comfort (Table 6). All these indicators were considered in the context of COVID-19 confinement.

Moreover, in the case of the main variables of thermal comfort, the Thermal sensation scale and Humidity sensation scale of the Adaptation of the Questionnaire of Indoor Thermal Environments [4] were applied; for mental health, Cohen's Scale of Stress Perceived PSS-14 [5]; and the Beck Anxiety Inventory (BAI) [6] were applied. These are described below in Table 7.

Table 8 presents the general descriptive data corresponding to each set of the main variables. These data are numerical and continuous, so they can be used for correlation, prediction, segmentation, and association analyses. The data is available in Microsoft Excel file format.
Table 5
Descriptive statistics regarding health lifestyles in confinement for COVID-19.

| Data                                           | Min | Max | Mean  | Median | SD   | IR  |
|------------------------------------------------|-----|-----|-------|--------|------|-----|
| Number of usual hours of sleep per day         | 1   | 12  | 6.32  | 6.00   | 1.48 | 2   |
| Number of usual meals per day                  | 1   | 10  | 2.72  | 3.00   | 1.08 | 9   |
| Number of hours dedicated to physical activity in the week | 0   | 45  | 3.11  | 2.00   | 4.74 | 5   |

Note: SD - standard deviation; IR - interquartile range.

Table 6
Data about environmental conditions regarding thermal comfort.

| Data                             | Relative frequency (f) | Absolute frequency (%) |
|----------------------------------|------------------------|------------------------|
| **Data of residence**            |                        |                        |
| **Length of residence (year(s))**|                        |                        |
| 0–5                              | 67                     | 21.2                   |
| 6–10                             | 36                     | 11.4                   |
| 11–15                            | 47                     | 14.9                   |
| 16–20                            | 106                    | 33.5                   |
| 21–25                            | 53                     | 16.8                   |
| 26–30                            | 4                      | 1.3                    |
| 31–35                            | 2                      | 0.6                    |
| > 35                             | 1                      | 0.3                    |

| **Data of dressing**             |                        |                        |
| Present dressing: Upper:         |                        |                        |
| Shirt                            | 88                     | 27.8                   |
| T-shirt                          | 104                    | 32.9                   |
| Light blouse                     | 110                    | 34.8                   |
| Coat, sweater, sweatshirt        | 3                      | 0.9                    |
| Dress                            | 3                      | 2.2                    |
| None                             | 7                      | 0.9                    |
| Present dressing: Lower:         |                        |                        |
| Jeans                            | 80                     | 25.3                   |
| Shorts                           | 219                    | 69.3                   |
| Dress                            | 5                      | 1.6                    |
| Skirt                            | 6                      | 1.9                    |
| Other                            | 6                      | 1.9                    |
| Present dressing: Socks:         |                        |                        |
| Socks (light / short)            | 81                     | 25.6                   |
| Socks (long / thick)             | 14                     | 4.4                    |
| None                             | 221                    | 69.9                   |

| **Data of room**                 |                        |                        |
| Time spent in this room          |                        |                        |
| Morning                          | 61                     | 19.3                   |
| Noon                             | 20                     | 6.3                    |
| Afternoon                        | 182                    | 57.6                   |
| Evening                          | 53                     | 16.8                   |
| Habit for window opening         |                        |                        |
| Frequently                       | 215                    | 68.0                   |
| Occasionally                     | 60                     | 19.0                   |
| Seldom                           | 29                     | 9.2                    |
| Do not have windows              | 12                     | 3.8                    |
| Overall acceptance of thermal environments |                |                        |
| Absolutely unacceptable          | 14                     | 4.4                    |
| Unacceptably                     | 20                     | 6.4                    |
| Slightly unacceptable            | 63                     | 19.9                   |
| Slightly acceptable              | 96                     | 30.4                   |
| Acceptable                       | 115                    | 36.4                   |
| Absolutely acceptable            | 8                      | 2.5                    |
Table 7
Description of the scales (measuring instruments).

| Thermal sensation scale | Humidity sensation scale | The Scale of Stress Perceived of Cohen PSS-14 | Beck Anxiety Inventory |
|--------------------------|--------------------------|-----------------------------------------------|------------------------|
| +3 Hot                   | +3 Very humid            | It consists of 14 items. Seven are worded negative (1, 2, 3, 8, 11, 12, and 14), and the remaining seven are positive (4, 5, 6, 7, 9, 10, and 13). Each item was rated on a five-point Likert-type scale (0 = “not at all” to 4 = “very often”). Total scores were calculated after reversing positive items’ scores and then summing up all scores. Possible total scores range from 0 to 56. A higher score indicates greater stress. | It consists of 21 items that evaluate symptoms of anxiety on a four-point Likert scale ranging from 0 = “not at all” to 3 = “severely.” The anxiety level was scored using ordinal categories: normal (0–7 points), mild (8–15), moderate (16–25) and severe (26–63). |
| +2 Warm                  | +2 Humid                 |                                               |                        |
| +1 Slightly warm         | +1 Slightly humid        |                                               |                        |
| 0 Neutral                | 0 Neutral                |                                               |                        |
| 1 Slightly cool          | 1 Slightly dry           |                                               |                        |
| 2 Cool                   | 2 Dry                    |                                               |                        |
| 3 Cold                   | 3 Very dry               |                                               |                        |

Table 8
General descriptions of thermal comfort and mental health.

|                          | N  | Min | Max | Median | Mean | SD  | IR |
|--------------------------|----|-----|-----|--------|------|-----|----|
| Perceived stress         | 316| 3   | 4   | 27.00  | 26.28| 7.90| 11 |
| Anxiety                  | 316| 0   | 53  | 11.00  | 14.37| 11.54| 15 |
| Thermal sensation        | 316| -2  | 3   | 2.00   | 1.46 | 1.40 | 3  |
| Humidity sensation       | 316| -3  | 3   | 0.00   | 0.33 | 1.26 | 1  |

Note: SD - standard deviation; IR - interquartile range.

2. Experimental Design, Materials and Methods

This study was descriptive and cross-sectional. The data was collected through a survey applied to students from a public university who were using online learning platforms during the pandemic (COVID-19). They were in a hot and humid region of Mexico.

2.1. Materials

A survey was used for data collection. It was comprised of:

- A questionnaire expressly developed for this study inquiring about personal information such as sociodemographic, school status, Internet connection, and health characteristics. Developed for the purpose of this study.
- Adaptation of the Questionnaire of Indoor Thermal Environments: questions about the environment where they were located, their clothing, perception of the environment, and perception of thermal sensation and humidity [4].
- The Scale of Stress Perceived of Cohen [PSS-14], that measures the degree to which life situations are perceived as stressful. This consists of seven items worded negatively: 1, 2, 3, 8, 11, 12, and 14, and the remaining seven worded positively: 4, 5, 6, 7, 9, 10, and 13. Each item was rated on a five-point Likert-type scale 0 = never to 4 = very often. Total scores were calculated after reversing positive items’ scores and then summing up all scores. Possible total scores for PSS-14 range from 0 to 56. A higher score indicates greater stress [7].
- Beck Anxiety Inventory (BAI). It consists of 21 items that evaluate symptoms of anxiety on a four-point Likert scale ranging from 0 = “not at all” to 3 = “severely.” The anxiety level was scored using ordinal categories: normal (0–7 points), mild (8–15), moderate (16–25) and severe (26–63) [8,9].
Ethics Statements

This study complied with the General Health Law on Research. All procedures performed in this work followed the ethical standards of the institutional committee and the Helsinki declaration and was approved by the ethics committee of the Faculty of Chemical Sciences of the University of Veracruz's Coatzacoalcos Campus, with registration number UV-CA-540-RESEARCH006. Informed consent was obtained from all participants and participant data has been fully anonymized and confidential.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT Author Statement

C. Ramírez-Dolores: Writing – original draft, Formal analysis, Validation; L.A. Lugo-Ramírez: Data curation, Writing – review & editing; B.A. Hernández-Cortaza: Conceptualization, Methodology; G. Alcalá: Visualization, Resources; J. Lara-Valdés: Software, Investigation; J. Andaverde: Supervision, Funding acquisition, Project administration.

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