Data Article

Data on the relationship between caffeine addiction and stress among Lebanese medical students in Lebanon

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A B S T R A C T

Stress continues to be a global burden. It may be thought of as necessary to human thriving; however, challenging and unfavorable functioning may take place when many significant stressors are imposed repetitively or concurrently without resolve. Research suggests that medical students perceive higher levels of stress than students in other health-related disciplines [1–3]. Since caffeine is a psychoactive substance that stimulates the central nervous system, medical students use to consume it more than other students to overcome the stress they face due to studying. The paucity of knowledge regarding the trends of caffeine consumption among medical students in developed countries and especially in Lebanon has encouraged us to examine the relationship between caffeine addiction and stress among Lebanese medical students in Lebanon. A non-experimental cross-sectional correlational design was employed to gather data from a sample of 800 medical students enrolled in different studying years in different Lebanese universities. Well-established psychometric instruments were used in primary data collection method, which are the Medical Student Stressor Questionnaire (MSSQ) and the Caffeine Consumption...
Dependence Scale. The analyzed data is provided in the tables included in this article.

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1. Data

The data shows that the mean age of the participants is 21.92 ± 2.16 years, and that the majority of respondents belong to the first four academic years (462 students). Tables 1 and 2 provide more details regarding the demographic characteristics of medical students who participated, while Table 3 shows the perceived stressors measured by the MSSQ. The data indicate that 396 students (66.44%) are subject to high and severe academic related stress and that 31.2% report equally high and severe stress related to teaching and learning and social related stressors domains. Group activity is reported high and severely stressful by 180 students (30.2%). The inter and intrapersonal related stressor (IRS) and the drive and desire related stressor (DRS) seem to have minor effects of students; respectively 168 (28.18%) and 90 (15.1%) students report them as causing high and severe stress. Taking into consideration the general average of each stress domain as calculated using MSSQ, few significant data were noted. However, the data shows that there is a significant difference related to gender between ARS, IRS

Specifications Table

| Subject area | Psychology |
|--------------|------------|
| More specific subject area | Stress and Addiction |
| Type of data | Tables |
| How data was acquired | Quantitative Questionnaires: MSSQ and The Caffeine consumption and dependence Scale |
| Data format | Raw and Analyzed |
| Experimental factors | - Convenience Sample consisted of 800 medical students from various academic years. |
| | - Informed consent was obtained and signed. |
| | - Participation was anonymous and voluntary. |
| | - Comparison between different universities was omitted as requested by the majority of institutions' authorities. |
| Experimental features | The researchers measured the stress among medical students using the Medical Student Stressor Questionnaire (MSSQ) and the caffeine addiction using the Caffeine Consumption and Dependence Scale. |
| Data source location | Lebanon |
| Data accessibility | Data is available within this article |
| Related research article | Ríos, J. L., Betancourt, J., Pagan, I., Fabián, C., Cruz, S. Y., González, A. M., ... & Palacios, C. (2013). Caffeinated-beverage consumption and its association with socio-demographic characteristics and self perceived academic stress in first and second year students at the University of Puerto Rico Medical Sciences Campus (UPR-MSC). Puerto Rico health sciences journal, 32(2). |

Value of the Data

- The data provided in this paper may be used to increase awareness about the overlooked issue of caffeine addiction and stress among medical students.
- The data showed a high impact of academic issues such as academic year, having stressful social events, low socio-economic status, and being forced to study medicine on medical students stress and performance. This mandates thorough actions to be considered by both medical institutions and medical students to fight this stress and maintain a healthier life and academic development.
- Our data are concurrent with previous research studies, thus making it of interest to other researchers. This topic was tackled by multiple previous studies in Lebanon, where it found that Lebanese medical students and mainly 97% of them were unconsciously becoming addicted to caffeinated substances [1–4], and showing signs of anxiety, burnout and depression [5–9].
- The data can be used to carry out comparative studies in the same field of research.
and TLRS with females are more prone to be stressful in the three domains as reported respectively by general means (2.815, 1.679 and 1.852). Another significant difference is noted between income groups ARS and IRS; in both domains students belonging to high-income families are less subjected to stress in both domains with respective general means of 2.161 and 1.021. Nevertheless no significant differences are noted between different stress domains, parents’ status and other demographics (omitted from analysis) (Tables 4 and 5). Moreover, the value of Pearson’s correlation coefficient has been calculated among different stress domains and positive correlation was found among all domains. All correlations were significant at the 0.01 level (Table 6). The highest correlation is found between academic related stressors (ARS) and group activity related stressors (GARS), the latter correlates

| Table 1 | MSSQ perceived stressors. |
|---|---|
| Level of stress | ARS | IRS | TLRS | SRS | DRS | GRAS |
| | N | % | N | % | N | % | N | % | N | % |
| None | 24 | 4 | 24 | 4 | 22 | 3.7 | 28 | 4.7 | 14 | 2.3 | 26 | 4.4 |
| Mild | 46 | 7.7 | 232 | 39.3 | 204 | 34.2 | 158 | 26.5 | 368 | 61.7 | 188 | 31.5 |
| Moderate | 130 | 21.8 | 172 | 28.9 | 184 | 30.9 | 224 | 37.6 | 124 | 20.8 | 202 | 33.9 |
| High | 206 | 34.6 | 124 | 20.8 | 142 | 23.8 | 128 | 21.5 | 48 | 8.1 | 134 | 22.5 |
| Severe | 190 | 31.9 | 44 | 7 | 44 | 7.4 | 58 | 9.7 | 42 | 7 | 46 | 7.7 |
| Total | 596 | 596 | 596 | 596 | 596 | 596 | 596 | 596 | 596 | 596 |

| Table 2 | Stress domains and gender. |
|---|---|
| Stress domain | Gender | Mean ± Standard deviation | P value |
| ARS | Male | 2.234 ± 1.038 | <0.001 |
| | Female | 2.815 ± 0.838 | |
| IRS | Male | 1.233 ± 1.041 | 0.005 |
| | Female | 1.619 ± 1.103 | |
| TLRS | Male | 1.441 ± 1.033 | 0.003 |
| | Female | 1.825 ± 1.028 | |
| SRS | Male | 1.572 ± 0.959 | 0.19 |
| | Female | 1.876 ± 1.032 | |
| DRS | Male | 0.856 ± 1.052 | 0.26 |
| | Female | 1.571 ± 1.005 | |
| GARS | Male | 1.571 ± 1.005 | 0.8 |
| | Female | 1.808 ± 0.961 | |

| Table 3 | Caffeine consumption pattern and caffeinemia. |
|---|---|
| Caffeine concentration | Mean | Standard deviation |
| Daily caffeine intake in milligrams/day | 193.32 | 361.81 |
| Daily Caffeine intake in milligrams per KG of body weight per day | 2.807 | 5.17 |
| Random Plasma caffeine level in microgram/ml | 16.495 | 12.32 |

and TLRS with females are more prone to be stressful in the three domains as reported respectively by general means (2.815, 1.679 and 1.852). Another significant difference is noted between income groups ARS and IRS; in both domains students belonging to high-income families are less subjected to stress in both domains with respective general means of 2.161 and 1.021. Nevertheless no significant differences are noted between different stress domains, parents’ status and other demographics (omitted from analysis) (Tables 4 and 5). Moreover, the value of Pearson’s correlation coefficient has been calculated among different stress domains and positive correlation was found among all domains. All correlations were significant at the 0.01 level (Table 6). The highest correlation is found between academic related stressors (ARS) and group activity related stressors (GARS), the latter correlates

| Table 4 | Main reported sources of caffeine. |
|---|---|
| Source of caffeine | N | % |
| Coffee and its derivatives | 528 | 88.59 |
| Coca and its derivatives | 368 | 61.75 |
| Energy drinks | 209 | 35.06 |
| Tea | 170 | 28.52 |
| Artificial juices | 138 | 23.15 |
strongly with the teaching and learning related stressors domain. The intra and inter-personal stressors’ domain correlates positively and significantly with social related stressors (SRS), correlating largely at its turn with both TLRS and IRS. Although small correlation is noted between DRS (drive and desire related stressors) and ARS, a strong one prevails between the former and TLRS. Tables 7–9 show the descriptive data regarding caffeine consumption pattern, sources and addiction. Table 10
represents the Caffeine toxicity and withdrawal symptoms which were evaluated among participants reporting regular caffeine intake (446 students). Restlessness, nervousness and anxiety are the most reported symptoms. In addition, Table 11 highlights the main encountered withdrawal symptoms and their relative occurrence rates among participants. A Pearson's correlation test was carried out to examine the relationship between caffeine intake and various relevant variables. The data showed a significant correlation between daily caffeine intake, caffeine intake in Kg of body weight and random plasma caffeine level with Pearson's coefficients of 0.955 and 0.747 respectively. Also, a significant correlation was found among the daily time spent online and the daily caffeine intake and caffeinemia (0.988 and 0.985 respectively), smoking occupies the second place correlating largely with caffeine intake (0.971) and plasma caffeine (0.573) as shown in Table 12. Furthermore, another Pearson’s correlation test was carried out to examine the relationship between caffeine intake and caffeinemia on one hand and the stress domains on the other hand. The data showed that daily caffeine intake was significantly correlated with IRS (0.138), DRS (0.272) and TLRD (0.161), while caffeinemia was also strongly correlated with IRS (0.405), DRS (0.407) and TLRD (0.195) (Table 9). The questionnaires used to obtain the data are provided as a supplementary file to this article.

### Table 8
Pearsons’ correlation coefficient between caffeine related variables and some demographics.

|                         | Daily caffeine intake | Plasma caffeine level |
|-------------------------|-----------------------|-----------------------|
| Living conditions       | 0.078                 | 0.09                  |
| Daily time spent on internet | 0.988               | 0.985                 |
| Smoking and Hubble bubble | 0.971               | 0.573                 |
| Facebook account        | 0.365                 | 0.688                 |
| Rate of application use | 0.921                 | 0.438                 |
| Adult sites visits      | 0.783                 | 0.569                 |

### Table 9
Pearsons’ correlation coefficient between different stress domains, GPA categories, IAT categories, daily Caffeine intake and plasma caffeine level.

|                      | ARS   | IRS    | TLRS   | SRS   | DRS   | GARS   |
|----------------------|-------|--------|--------|-------|-------|--------|
| Daily Caffeine intake| −0.15 | 0.138a | 0.161b | 0.106 | 0.272b| 0.041  |
| Caffeinemia           | −0.056| 0.405b | 0.195c | 0.047 | 0.407b| −0.028 |

a Significant data at 0.05.  
b Significant data at 0.01.

### Table 10
Undesirable caffeine effects/caffeine toxicity.

| Sleep and anxiety related     |       |       |
|-------------------------------|-------|-------|
| Inability to sleep            | 34    | 7.62% |
| Inability to concentrate      | 30    | 6.72% |
| Restlessness                  | 240   | 53.81%|
| Excitement                    | 34    | 7.62% |
| Irritation                    | 38    | 8.52% |
| Hyperactivity                 | 50    | 11.21%|
| Nervousness                   | 210   | 47.08%|
| Anxiety                       | 200   | 44.84%|

| Somatic related               |       |       |
|-------------------------------|-------|-------|
| Red face                      | 32    | 7.17% |
| Hot flashes                   | 22    | 4.93% |
| Hives                         | 70    | 15.69%|
| Stomach aches                 | 54    | 12.1% |
| Headaches                     | 28    | 6.27% |
| Muscular twitches             | 18    | 4.03% |
| Fast heart beats              | 144   | 32.28%|
| Irregular heart beats         | 178   | 39.91%|
| Rambling speech               | 68    | 15.24%|

represents the Caffeine toxicity and withdrawal symptoms which were evaluated among participants reporting regular caffeine intake (446 students). Restlessness, nervousness and anxiety are the most reported symptoms. In addition, Table 11 highlights the main encountered withdrawal symptoms and their relative occurrence rates among participants. A Pearson’s correlation test was carried out to examine the relationship between caffeine intake and various relevant variables. The data showed a significant correlation between daily caffeine intake, caffeine intake in Kg of body weight and random plasma caffeine level with Pearson’s coefficients of 0.955 and 0.747 respectively. Also, a significant correlation was found among the daily time spent online and the daily caffeine intake and caffeinemia (0.988 and 0.985 respectively), smoking occupies the second place correlating largely with caffeine intake (0.971) and plasma caffeine (0.573) as shown in Table 12. Furthermore, another Pearson’s correlation test was carried out to examine the relationship between caffeine intake and caffeinemia on one hand and the stress domains on the other hand. The data showed that daily caffeine intake was significantly correlated with IRS (0.138), DRS (0.272) and TLRD (0.161), while caffeinemia was also strongly correlated with IRS (0.405), DRS (0.407) and TLRD (0.195) (Table 9). The questionnaires used to obtain the data are provided as a supplementary file to this article.
### 2. Experimental design, materials, and methods

#### 2.1. Design

A cross-sectional descriptive correlational design was used to assess and quantify the main sources of stress, caffeine consumption, caffeine intake behaviors, and examine the relationship between the stress and caffeine.

#### 2.2. Sample and settings

A convenience sample of medical students enrolled in different studying years in different Lebanese universities was adopted. A total of 800 students were approached to participate in the data collection, 720 of them consented for enrollment (90% respond rate) and only 596 students have completed appropriately and fully the questionnaire to be suitable for analysis. The ethical approval was obtained from Institutional Review Board of Beirut Arab University. The students were approached by the researcher, where the aim of the study was explained, and participants were informed participation is voluntary and anonymous, then they were asked to sign an informed consent, and then fill the paper-based questionnaires after explaining the items. The students were sampled from medical schools that follow the Lebanese educational system, where students need to finish 6 years of education to graduate as general physicians.

#### 2.3. Questionnaires

Well-established psychometric instruments were used in the data collection method. The first questionnaire employed was the short version of the Medical Student Stressor Questionnaire (MSSQ) which consists of 20 items representing the six main stressor domains studied among medical students [10,11]. Stressors are grouped in six hypothetical groups: academic related stressors (ARS), intrapersonal and interpersonal related stressors (IRS), teaching and learning-related stressors (TLRS), social related stressors (SRS), drive and desire related stressors (DRS), and group activities related stressors (GARS). Based on score analysis perceived stress in each category is classified as mild, moderate, high and severe with respective scores of 0.00–1.00, 1.01–2.00, 2.01–3.00 and 3.01–4.00. The validation

#### Table 11

| Withdrawal symptoms                  | N  | %  |
|--------------------------------------|----|----|
| Fatigue                              | 174| 39.01|
| Drowsiness                           | 94 | 21.07|
| Depression and or anxiety            | 70 | 15.96|
| Stomach aches                        | 34 | 7.62|
| Vomiting                             | 24 | 5.38|
| Headaches                            | 148| 33.18|
| Irritability                         | 108| 24.21|
| Craving for caffeine                 | 142| 31.83|

#### Table 12

Pearsons’ correlation coefficient between caffeine related variables and some demographics.

|                             | Daily caffeine intake | Plasma caffeine level |
|-----------------------------|-----------------------|-----------------------|
| Living conditions           | 0.078                 | 0.09                  |
| Daily time spent on internet| 0.988                 | 0.985                 |
| Smoking and Hubble bubble   | 0.971                 | 0.573                 |
| Facebook account            | 0.365                 | 0.688                 |
| Rate of application use     | 0.921                 | 0.438                 |
| Adult sites visits          | 0.783                 | 0.569                 |
found that the MSSQ has good psychometric properties; it is a valid and reliable instrument that can be used to identify students’ stressors as well as measure the intensity of the stressors. Factor analysis shows that all the items are well distributed according to the six groups. Reliability analysis shows that the MSSQ has a high internal consistency as Cronbach’s alpha coefficient value was 0.95. The Caffeine consumption and dependence Scale: The Substance Abuse Module (SAM) was the other questionnaire used for the data and was the only available structured interview that assesses caffeine dependence based on the International Diagnostic Interview-Substance Abuse Module (DSM V) criteria. This scale consisted of 7 questions, their answers yield a diagnostic algorithm that was developed by the Washington University team and checked by members of the DSM-IV Field Trials. Daily caffeine consumption was calculated based on the daily intake of its different sources: coffee and its derivatives, soft drinks and energetic drinks. Beside a random plasma caffeine levels using high performance liquid chromatography was measured after blood collection from willing and consenting participants [12].

2.4. Statistical analysis

Data entry and analysis were performed using Statistical Package for the Social Sciences (SPSS) Version 24 [13]. Descriptive data are reported as means and standard deviations or as percentages. Correlational analyses were used to assess relationships between studied variables.

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Conflict of 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.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104845.

References

[1] Y.G. Bachner, H. Castel, T. Kushnir, Examination of a modified version of the Psychological Medical Inventory among medical students, Med. Teach. 30 (1) (2008) 94–96.
[2] Z. Tsintsiou, A.B. Haidich, D. Spachos, S. Kokkali, P. Bamidis, T. Dardavessis, M. Arvanitidou, Internet addiction in Greek medical students: an online survey, Acad. Psychiatr. 39 (3) (2015) 300–304.
[3] C.L. Palladino, B. Ange, D.S. Richardson, R. Casillas, M. Decker, R.A. Gillies, R. Zeidan, Measuring psychological flexibility in medical students and residents: a psychometric analysis, Med. Educ. Online 18 (1) (2013) 20932.
[4] M. Tannous, Y. Al Kalash, Prevalence of caffeinated-beverage consumption by university students in North Lebanon, Public Health Res. 4 (5) (2014) 173–178.
[5] F. Talih, R. Warakian, J. Ajaltouni, H. Tamim, Correlates of depression and burnout among residents in a lebanese academic medical center: a cross-sectional study, Acad. Psychiatr. 40 (1) (2016) 38–45.
[6] F. Talih, M. Daher, D. Daou, J. Ajaltouni, Examining burnout, depression, and attitudes regarding drug use among Lebanese medical students during the 4 years of medical school, Acad. Psychiatr. 42 (2) (2018) 288–296.
[7] W.J. Naja, A.H. Kansoun, R.S. Haddad, Prevalence of depression in medical students at the Lebanese University and exploring its correlation with facebook relevance: a questionnaire study, JMIR Res. Protocols 5 (2) (2016) 96.
[8] M.A. Elzubeir, K.E. Elzubeir, M.E. Magzoub, Stress and coping strategies among Arab medical students: towards a research agenda, Educ. Health 23 (1) (2010) 355.
[9] M.S. Khan, N. Nisar, S.A.A. Naqui, F. Nawab, Caffeine consumption and academic performance among medical students of Dow university of health science (DUHS), Karachi, Pakistan, Ann. Abbasi Shaheed Hosp. Karachi Med. Dental Coll. 22 (3) (2017).
[10] S.M. Downing, Reliability: on the reproducibility of assessment data, Med. Educ. 38 (9) (2004) 1006–1012.
[11] M.S.B. Yusoff, The validity and reliability of secondary school stressor questionnaire (3SQ) in identifying stressor among adolescents in secondary school, Int. Med. J. 18 (2) (2011) 99e105.
[12] E.B. Foa, M.J. Kozak, DSM-IV field trial: obsessive-compulsive disorder, Am. J. Psychiatry 4 (1995).
[13] IBM Corp, IBM SPSS Statistics for Windows, Version 24.0, IBM Corp, Armonk, NY, 2016.