Planning an Analysis of Student Stress during a Pandemic: Adapting Bioanthropological Methods to Social Distance Guidelines

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ABSTRACT
Undergraduate college students are overworked and under great stress. Before the recent pandemic, we were interested in understanding this stress and its ramifications on our diet and health. Northern Arizona University (NAU) is an important place to do this type of research, as many first-generation students enroll here. First-generation students may have a difficult time asking for help with their studies and are more prone to dropping out of college than students with family college experience. As interns in a Biological Anthropology laboratory, we looked for ways to use bioanthropological methods to understand this stress and were recently awarded funds from NAU to conduct human hair research on fellow students. We proposed to analyze both qualitative and quantitative data to determine the correlations between different aspects of a student’s stress level, dietary habits, and health and plan to collaborate with a bioarchaeologist, an anthropological human biologist, and a hormone biologist to examine these correlations from as many angles as possible. With the COVID-19 pandemic, we have had to restructure our methods and hypotheses to better account for the new stressors that are affecting students. In this commentary, we discuss the specifics of these new stressors students are facing - including a modified school calendar and student job loss - and propose best practices for biological research of this nature during a pandemic.

Keywords
Stress, isotopes, hormones, methodological innovation, pandemic.

Global pandemics are outbreaks of disease, generally caused by a virus or bacterial species, spread over large geographical areas. Anthropological and archaeological data have shown that earlier pandemics have wreaked havoc in past societies. The bacterial species Yersinia pestis, which caused the Plague of Justinian in Asia and, years later, the Black Death in Europe, led people to believe that their only option was death. Many individuals stopped caring about others’ fates and blamed certain groups of people for the horrible things happening to them (DeWitte 2014). The 1918 Influenza pandemic, or Spanish Flu, which spread globally, similarly left panic in its wake due to its high rate of transmission and how frequently it led to death (Parmet and Rothstein 2018).

Fear associated with pandemics stems, in part, from the fact that outbreaks are difficult to understand, prepare for, and control. Scapegoating a certain group of people, such as the Jews during the Black Death, only creates more panic, fear, and stress. Societies’ reactions to the COVID-19 pandemic are - so far - in line with past responses. Powerful individuals are blaming Chinese people for the creation of the virus; misinformation is spreading like wildfire and large groups of people are refusing to wear basic face coverings to help protect other people, hinting at an every-man-for-himself scenario. The constant, dramatic
(and often unreliable) reporting on hourly news broadcasts and on social media make it extremely easy to be fearful and stressed during this time.

Prior to the outbreak of the pandemic in the United States, all three authors were interning at the Northern Arizona University (NAU) Paleodiet Lab under the direction of faculty mentor Dr. Corina Kellner. In this laboratory, we analyze archaeological skeletal materials via the stable isotopes of carbon and nitrogen from bone apatite and collagen. Prior to the switch to online classes, we applied for the Hooper Undergraduate Research Award (HURA) to fund our mixed-methods hair study, which was planned to include surveys, anthropometric measures, and hair isotopic and hormonal analysis. The purpose of this interdisciplinary study, which is to be completed during the 2020–2021 school year, is to determine how stress correlates with diet and health in NAU college students. The interdisciplinary aspect is important because it teaches us that we can produce data that is relevant to our lives and can be used to improve the student experience at Northern Arizona University by learning new skills and collaborating with various disciplines within and outside of Anthropology, such as a bioarchaeologist, an anthropological human biologist, and a hormone biologist.

We hoped to bring to bear a different perspective on our question of student stress by using a mixed methods approach and consulting with experts in human biology, hormone biology, and dietary isotopes. Self-surveys give us a look at students’ lives from their own perspective so we can understand how they view and deal with stress. The Anthropometric Empirical Indicator (circumferences of the waist, hip, neck, and chest) is a more accurate way to ascertain body fat than BMI (Mohan et al. 2013), which can be misleading and discriminate against certain population groups (e.g., Carey 2019). Isotopic ratios and stress hormones deposited in hair keratin provide a permanent quantitative marker of diet and stress, respectively (e.g. Kusaka et al. 2016; Stalder et al. 2017). As diet and stress are known to be linked, college students with high levels of stress are also more likely to have disordered eating patterns (e.g., Nastaskin and Fiocco 2015). A comparison of qualitative and quantitative data will show us a broad picture of the student stress experience.

When we first submitted our HURA application the world was considered “normal”—meaning that the virus had not yet hit the United States in the large waves seen today, mass protests over racial inequality and injustice had not yet broken out, and the prominent “mask fights” over whether the government has the power to force someone to wear a mask were not yet occurring. In other words, factors that we did not think we would have to consider in our initial comparison of stress and diet in first- and continuing-generation college students must now be considered. Instead of just focusing on school-related stress during times perceived as high-stress (like finals week) and low-stress (like winter break), we will now have to consider global factors and how these current worldly triggers may be affecting college students.

Among these factors is the revised school year, which is scheduled to begin and end early. NAU changed its academic calendar to begin (August 12, 2020) and end (November 25, 2020) to tamp down virus spread during the height of the flu season by diminishing student travel back to campus after Thanksgiving. We noticed that this announcement, made in June 2020, caused panic among the NAU community. Faculty would need to have course materials ready nearly two weeks before originally anticipated. Students would need to figure out where to live until their apartment complexes would let them move in, as most student-housing leases in Flagstaff do not start until the weekend before school typically starts. Additionally, out-of-state students would need to purchase new arriving and departing flights. Finding housing in Flagstaff is already difficult and the rise in COVID-19 infections in Arizona is causing many students to question whether they should even return to campus this semester. The combination of all these factors is sure to increase student stress. Although stressors impact each student differently, it is likely that their accumulative pressure will make normal high-stress times, like final exam periods, even more volatile than is usual.

This upcoming fall semester, NAU will also
integrate more online options into the class schedule, and likely continue doing so in the years to come. While this plan allows for more social distancing measures to be observed on campus, it does not consider the fact that many students do poorly with fully or partially online classes. Research has suggested that college students must be self-disciplined and heavily self-reliant in order to succeed in online classes compared to fully in-person classes (Gregory 2016). Freshman students coming to college straight out of high school may have difficulty doing this, especially as college is generally a young person’s first time fully away from their parents who typically hold teenagers accountable at home. Additionally, reliable Internet access is essential for completing fully or partially online assignments and classes. Yet, some students do not have reliable access to the Internet, such as those living in the Navajo Nation (Donnellan 2017). If an optional pass/fail class format is not enacted again, as was seen in the Spring 2020 semester, students may become more stressed about doing poorly in classes due to factors beyond their control.

COVID-19 has also created a loss of jobs, both on-campus and off-campus, for students across the university. For example, NAU advertises and offers a wide range of fitness classes for students to take, from CrossFit to aquatic classes to horseback riding. However, many of these fitness classes have been cancelled due to worries over transmission between participants in an environment where they cannot safely wear masks or other face coverings. Many students count on the income these types of jobs provide to pay for rent and other college-related expenses. Other jobs on-campus, such as those at the Health and Learning Center (recreation center) and Wall Aquatic Center (pool), are running at reduced hours, leaving fewer chances for students to earn additional income. The bleak job market in Flagstaff cannot offer much hope for students looking for replacement jobs unless they are willing to work in the Flagstaff Medical Center, where several new full time and part time job opportunities have been added (Job Listings n.d.). Individuals at high-risk for catching the virus, or those living with family members in the high-risk category, likely cannot apply for such positions unless they want to put themselves or their loved ones in danger of contracting the virus.

Because Flagstaff and NAU are located extremely close to the Navajo Nation in the northern Arizona region, many enrolled students come from this area, which has been one of the hardest hit in the country. With the high number of cases on the reservation, public health officials have ordered families to stay in-place, ideally within their homes for weekend periods of 57 hours to decrease transmission of cases between individuals in the community (Dikos Ntsaalgíí-19 2020). As previously mentioned, these lockdowns will be problematic for NAU students who live in the Navajo Nation, as will the low internet access in indigenous communities. Approximately 70% of families have no access to high-speed and high-capacity broadband (Blackwater 2020). If students are given assignments over the weekend and they live on the Navajo Nation, they may not be able to complete the task on time due to a lack of internet access. Additionally, it may be impossible for these same students to complete mandated online (NAUFlex) class days, unless they go to campus—in which case they may be putting themselves in a high-risk situation.

Our protocol, methods, and hypotheses have shifted to account for these new stressors. If we are allowed to go forward with our hair study, our research protocol will change. We will have to include PPE for ourselves and face masks for our participants. Additionally, even though we will have to carefully collect hair, we should limit contact with each participant by modifying AEI collection by instructing them to measure themselves with a tape measure, which we will clean after every use. Our survey will drastically change and incorporate the new stressors that students are facing in this new normal of pandemic. Last but not least, our informed consent will outline these new safety protocols and highlight the right of participants to leave the study. In the lab it will be essential to wear PPE such as gloves, lab coats, masks, and face shields. Luckily, we are able to make these changes and maintain social distancing since we are located at a smaller university.

In this time of change, uncertainty, and
illness, stress research is particularly relevant. We hope our study will provide actionable findings valuable to the students of NAU, its administration, and to us, as researchers. Listening to student experiences and studying their physical counterparts in hair (and bodies generally) is crucial for understanding how to help students better balance social, work, family, and class obligations. We believe a mixed methods approach is the best method to tie all these disparate data sets together.

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WORKS CITED


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