STRESS AT COLLEGE: EFFECTS ON HEALTH HABITS, HEALTH STATUS AND SELF-ESTEEM

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The results from a random survey of students (N=145) are analyzed to address three questions: 1) Are students in certain demographic groups prone to experience higher levels of stress? 2) Is there a relationship between stress and other health behaviors? and 3) Do "stressed" students possess lower levels of self-esteem or perceive themselves as less healthy? We find that females and non-athletes are more likely to be "stressed," and that "stressed" students are less likely to practice healthy behaviors and are more prone to practice bad habits (e.g., eating junk food). Students under greater stress also exhibit lower levels of self-esteem and reduced perceptions of their health status. The implications of these findings for stress reduction programs on college campuses is discussed.

Literature Review

Stress is an individualized phenomenon, unique to each person and setting. Pearlin (1989) has suggested that there are two major types of stressors: life events and chronic strains. Life events research considers the extent to which the accumulation of a series of experiences can create a stressful impact. Stress from chronic strain results in role overload: conflicting roles in an individual's life that produce competing, and potentially conflicting, demands over time. Role conflict is a common part of the college experience. College students must learn to balance the competing demands of academics, developing new social contacts and being responsible for their own daily needs (e.g., nutrition and clean clothing). In addition, while the academic workload requires that students face a series of peak periods such as midterms and finals, there is a relatively constant underlying pressure to complete an upcoming assignment.

The transition to college creates a situation where regular contact with traditional supports, e.g., friends from high school and family, may be reduced. The ability of such social supports to mediate the effect of exposure to stress is well documented (Ensel and Lin, 1991; Moss, 1973; Schutt et al. 1994; Thoits, 1995). College marks a period where new systems of social support are being created. This process can, in and of itself, be stressful. Research has shown that events which might otherwise serve to reduce stress, e.g., peer events and social activities, can actually increase feel-

ings of stress during college (Dill and Henley, 1998).

New peer groups that form in college can influence patterns of thought and behavior. Lau et al. (1990) have shown that there is substantial change in the performance of health behaviors during the first three years of college, and that peers can have a strong impact on the types and magnitude of these changes. It seems reasonable, then, that peers may also influence the perception of and reaction to stress. College norms that define certain types of behavior as "appropriate" under certain conditions, e.g., staying up all night to study for an exam, may be stress inducing and may lead to less healthy practices.

Stress has been associated with a variety of negative outcomes in the adolescent population including suicide ideation (Hirsch and Ellis, 1996); smoking (Naquin and Gilbert, 1996); and drinking (Morgan, 1997; McCormack, 1996). Research has also documented that females (Megel et al., 1994) and student athletes (Nattiv and Puffer, 1991) are more likely to perceive higher levels of stress. The effects of excess stress on healthy behaviors is less well researched within the college-aged population.

Our research was undertaken at an ivy-league institution where high levels of stress are characteristic for much of the student body. We set out to address three key questions: 1) Are there certain demographic groups who are prone to feel higher levels of stress? 2) Are "stressed" students more likely to exhibit other unhealthy behaviors? and 3) Do "stressed" students exhibit lower levels of self-esteem and reduced perceptions of their health status?

Method

The Setting and Subjects

This study was completed as part of an assignment for a class in survey research methods at an Ivy-league institution. The sample included on-campus undergraduate students. Student researchers distributed two-hundred and twenty-five surveys designed for anonymous response. The researchers hand-delivered the surveys to randomly chosen dormitory rooms. They were advised to knock, and if an occupant was home, briefly describe the purpose of the research and provide the occupant with a copy of the survey instrument. If no one was home, the survey was taped to the door.

The survey package included a cover letter, a copy of the survey questionnaire and a band-aid. Respondents were requested in the cover letter to use the band aid to attach their completed survey to the outside of their door within the next twenty-four hours. The student researchers returned to each room twenty-four hours later to collect the completed surveys. In cases where a response was not provided, the researchers provided a second copy of the instrument using the procedures described above, and returned twenty-four hours later, in a final attempt to collect any surveys completed in this second round. The cover letter indicated that any resident of the suite was eligible to complete the survey (the majority of rooms included in our survey contained more than one resident). It also outlined the purpose of the study and provided assurances regarding anonymity. A total of 145 surveys were returned for a 64.4% response rate.

The Study Variables

The survey questions were designed to gather information across several different areas: 1) demographic data; 2) health status data; 3) health related habits (e.g., diet, sleep and exercise); and 4) esteem. The demographic questions included information on sex, class, race, height and weight. To assess health status, we used the two standardized questions pertaining to general health (Ware, 1993). Students were asked "In general, would you say your health is: excellent, very good, good, fair or poor." The second health question required respondents to describe whether a series of statements about their health were definitely true, mostly true, mostly false, or definitely false. Students could also choose "don't know" as an option. The statements included: 1) I seem to get sick a little easier than other people; 2) I am as healthy as anybody I know; 3) I expect my health to get worse; and 4) My health is excellent.

We also assessed health related habits across a broad spectrum of behaviors. Students provided information on how frequently they: get enough sleep, feel stressed, eat breakfast, take vitamins and eat fruits and vegetables. Their responses were graded on a 1-6 scale ranging from "all of the time" to "none of the time." An additional "does not apply" option was also provided. Students were also asked whether they had consumed various healthy and junk foods within the past twenty four hours. Two separate questions were designed to determine student sexual practices pertaining to the use of condoms and other forms of birth control. The response categories were pre-coded as: always, sometimes, never or does not apply. The frequency of alcohol consumption was recorded in a similar manner, using a unique set of response categories: more than twice a week, about once or twice a week, about 3-4 times a month, about 1-2 times per month or never. Students who drink were asked to provide estimates of the number of beers, glasses of wine and shots that they consume "in a typical week."

The survey included three questions pertaining to their exercise habits: 1) Are you a member of a varsity or junior varsity team? 2) Would someone who knows you well describe you as a person who "works out regularly?" and 3) Aside from varsity sports, do you exercise or play sports regularly? If they responded affirmatively to this last question, students were asked to provide a list of activities in which they participate along with an estimated number of hours per week in which they engaged in these sports.

Finally, questions on self-esteem were designed to assess the level of respondents' satisfaction with GPA, fitness and weight. The responses were provided on a four-point scale: very satisfied, generally satisfied, somewhat dissatisfied and very dissatisfied.

Analysis

The responses were coded by the student researchers, and the accuracy of data entry was verified by the principal investigator. The analyses were performed using SPSS Version 9.0. The results section begins with a description of our key findings. We then present chi square analyses which have been designed to answer a

series of research questions: 1) Who is more likely to experience stress? 2) Does being "stressed" affect other health-related behaviors? and 3) Do "stressed" students experience reduced perceptions of their health status and self esteem?

Results

Descriptive Findings

Demographics, Health Status and Stress

The respondents were predominantly female (55.2%). Class representation was not evenly distributed in the respondent pool. The majority of respondents were seniors (42.1%), with a relatively even mix of juniors (20.0%) and sophomores (29.7%). Only 8.3% of the respondents were freshmen. This is due largely to the process by which the surveys were distributed. Our random selection of dormitories included buildings that housed primarily upperclassmen. To compensate for this, one student researcher visited a freshman housing complex to distribute additional surveys. This poses a potential limitation to our results, however, given that their may be unique facets of stress that arise in housing that is segregated by class. For the purpose of the analyses below, class is treated as a bivariate variable comprised of "upperclassmen" (juniors and seniors) and "lower classmen" (freshmen and sophomores).

The racial composition of our sample was predominantly white (62.2%). Asians were also well-represented in the sample (20.3%). Students from other racial categories were represented on a more limited basis: Blacks (5.6%); Mexican Americans (2.1%); Puerto Ricans (3.5%); Other Hispanic/Latino (0.7%); and Others (5.6%). The racial categories selected for the survey were copied from the application for admission for consistency. Table 1 compares the demographic attributes of student respondents with those of the undergraduate population of students.

We coded our respondents' heights and weights, using the Metropolitan Life scale, as "normal" or "not normal." Students

Table 1
Student Respondent and Campus Demographics

Variable	Sample N	Sample %	Campus N	Campus %
Gender				
Male	65	44.8%	2,656	50.5%
Female	80	55.2%	2,601	49.5%
TOTAL	145	100.0%	5,257	100.0%
Class				
Freshman	12	8.3%	1,299	24.7%
Sophomore	43	29.7%	1,279	24.3%
Junior	29	20.0%	1,046	19.9%
Senior	61	42.1%	1,633	31.1%
TOTAL	145	100.0%	5,257	100.0%

Race				
White	89	61.4%	2,839	54.0%
Asian	29	20.0%	853	16.2%
Black	8	5.5%	385	7.3%
Native American	0	0.0%	38	0.7%
Hispanic	9	6.2%	310	5.9%
Other	8	5.5%	832	15.9%
TOTAL	143*	98.6%	5,257	100.0%

*NOTE: Two respondents failed to indicate a racial category, and were treated as "missing" cases in terms of their race.

were defined as normal when their weight fell within the acceptable range for any body frame (small, medium or large) at their height. Using these criteria, 66.2% of respondents were defined "normal" or at an appropriate weight for their height.

The majority of student respondents indicated that their health was either "excellent" (22.1%), "very good" (45.5%), or "good" (27.6%). Only 4.8% of respondents described their health as "fair" or "poor." In the chi square analyses, these responses were collapsed into two categories of health: "healthy" students are those who indicated their health is "excellent" or "very good." Students in the remaining categories are described as "less healthy."

Most students (52.1%) indicated relatively high levels of stress during the course of a "typical semester." For the purpose of the bivariate analyses, this variable was collapsed into two categories: students stressed "all," "most" or "a good bit" of the time (55.6%) comprise the high stress group. Students indicating that they feel stress "some," "a little" or "none" of the time comprise the low stress group (44.5%). We used this same process to create bivariate variables for sleep, eating breakfast, taking vitamins and eating fruits and vegetables.

Consumption Patterns

In terms of their eating habits, more than half of the respondents (69.2%) indicated that they eat fruits and vegetables and a good bit of the time or more. However, about a third of the sample (29.2%) reported that they never consume breakfast, and almost half (40.3%) do not take vitamins. Our respondents' eating habits over the past twenty-four hours had also been somewhat unhealthy. They reported consuming: junk food (71.1%); soda (63.8%); vegetables (73.6%); whole grain bread (41.0%); and candy (57.3%).

Nearly half of the respondents (48.3%) indicated that they drink once a week or more. Beer tended to be consumed in the largest quantities. On average, beer drinkers indicated that they drink 3.37 beers in a typical week. In contrast, wine drinkers averaged 1.16 glasses of wine, and shot drinkers averaged 2.69 shots, in a typical a week. Beer drinkers reported

the highest variability in consumption.

Other Health-related Behaviors

We surveyed students on several other health-related behaviors, including their use of seat belts, condoms and birth control, and the extent to which they exercise. The overwhelming majority of students practice vehicular safety: 93.8% indicate that they use a seat belt "a good bit of the time" or more frequently. With respect to their sexual practices, about half of the students indicated that the use of condoms (46.3%) and other types of birth control (54.5%) was not applicable to them. Among those who are sexually active, the majority of respondents indicated that they use condoms "always" (53.4%) while 26.0% use them "sometimes" and 20.6% "never" use them. A similar pattern exists among sexually active students and the use of other forms of birth control: 55.7% "always" use it, 27.9% use it "sometimes" and 16.4% "never" use it.

Only a few varsity athletes responded to our survey (N=15). However, roughly two-thirds of our sample (59.7%) indicated that they exercise. While our respondents averaged 6.2 hours of exercise per week, the amount of activity reported ranged from no exercise to seventeen hours per week with a standard deviation of 3.35 hours per week. There were a wide variety of activities reported by our respondents: most popular among them were running and weight lifting. For the purpose of the chi square analyses presented below, we defined an "athlete" as anyone who participates on a varsity sport or who exercises for a minimum of seven hours a week, i.e., an hour or more a day. Using these criteria, athletes comprise about a third (28.3%) of our sample (N=41).

Most students reported that they are "very satisfied" or "generally satisfied" with their weight (67.6%). In contrast, only about half of our respondents are satisfied with their GPA (47.9%) and fitness level (52.4%).

Who is Most Likely to be Stressed?

We hypothesized that several demographic factors might be related to students' perceptions of their stress level. Thus, we analyzed whether there were differences

Table 2
Demographic Traits of "Stressed" Students

Variable	Chi Square	df	p value
Gender	5.743	1	0.017*
Race	1.088	2	0.58
Class	4.688	3	0.196
Athleticism	6.344	1	0.012*

in perceived stress by gender, academic class, race and athletic status. Our findings are significant for both gender and athleticism (see Table 2). The majority of females (63.8%, N=51) express feeling stress often, while in contrast, only 36.3% of males (N=29) report being stressed frequently. Non athletes also perceive higher levels of stress. The vast majority (80.0%) of students who do not participate in sports regularly report high levels of stress. Over a third (39.1%) of the low-stress group are athletes. These findings are quite consistent with the medical literature that suggests exercise serves to reduce stress.

Is stress related to the practice of other health behaviors?

The consumption patterns of "stressed" students are different from those of non-stressed students in several important ways (Table 3). Those who experience high levels of stress are more likely to practice a number of unhealthy behaviors. While 72.7% of "stressed" students (N=56) drank soda in the previous twenty-four hours, only 52.4% (N=33) of the "less stressed"group had done so. Similarly, 78.2% (N=61) of the "stressed" group had consumed junk food, whereas 61.9% (N=39) of the lower stress group had done so.

There were also significant differences in the exercise patterns of the two groups. Respondents with higher levels of stress were significantly less likely to exercise regularly. While less than half (43.8%, N=35) of the "stressed" group stated that they work out regularly, the majority of "non stressed" students (60.9%, N=39) indicated that they exercise.

"Non-stressed" students are also significantly more likely to consume fruits and vegetables. While 39.2% of the "stressed" group (N=31) indicated that they consume fruits and vegetables infrequently, this is true for only 20.3% (N=13) of the low stress group. While the difference in sleep patterns between these two groups was not significant, it was nearly so: only 41.3% (N=33) of highly stressed students indicated that they get enough sleep regularly, while the majority of low stress students (56.3%, N=36) do so. Interest-

Table 3
Stress and Other Health Habits

Variable	Chi Square	df	p value
Eat breakfast	0.169	1	0.681
Eat fruits/vegetables	5.947	1	0.015*
Take vitamins	0.356	1	0.550
Drink soda	6.194	1	0.013*
Eat junk food	4.490	1	0.034*
Eat candy	0.437	1	0.509
Get enough sleep	3.206	1	0.073
Consume alcohol	0.017	1	0.896
Work out regularly	4.205	1	0.040*

ingly, there are no differences in the drinking habits of "stressed" and "non-stressed" students. This is true when comparing perceived stress among drinkers and non-drinkers, as well as when comparing perceptions of stress among students across various levels of alcohol consumption.

Do "stressed" students experience reduced perceptions of health and self-esteem?

Students who experience higher levels of stress also exhibit lower levels of satisfaction with their overall health, as noted in Table 4. The percentage of "stressed" students who perceive themselves as healthy (55.0%) is nearly equivalent to those who indicate that they are less healthy (45.0%). In contrast, those in the low stress group are significantly more likely to describe their health as "excellent" or "very good" (82.8%). These differences carry over into perceptions of self esteem as well. "Stressed" students are significantly less satisfied with their GPA, weight and fitness level. Clearly, stressed students are much less satisfied with a variety of life factors that contribute to self-esteem. It remains unclear, however, whether high levels of stress reduce self-worth, or whether stress is a by-product of poor academic performance and lower levels of fitness.

Discussion

Our results suggest a relationship between perceived levels of stress among college students, their health habits, health status and self esteem. Students with high levels of stress tend to perceive themselves as less healthy; they possess lower levels of self-esteem; and they are more prone to practice a number of poor health habits. There are several methodological concerns that may limit the generalizability of these results.

It is likely that students with less healthy practices (e.g., those who drink more and exercise less) responded less often to our survey. While we formatted the cover letter to emphasize our interest in student practices in a general way, the content of the survey questions and their focus on health and health-related habits may have produced a social desirability bias (i.e.,

Table 4
Perceived Health and Satisfaction with Weight, Fitness and GPA

Variable	Chi Square	df	p value
Perceived Health	12.51	1	0.000*
Weight	7.961	1	0.005*
Fitness	18.081	1	0.000*
GPA	7.466	1	0.006*

those with less healthy practices were less apt to respond). In addition, there were a number of questions where students may have conceptualized their responses in different ways. For example, we asked students to describe their consumption of alcohol in a "typical" week. Such wording leaves the individual respondent to decide what is "typical." Our definition of an athlete as someone who either participates on a varsity sport or who works out at least an hour a day or more, on average, may also be limiting. It is possible, for example, that someone who works out for five hours a week year-round is in better condition than a single season varsity athlete who does not work out during the off-season. Despite these limitations, we see several implications for future research and policy.

First, the relationship between gender and stress among college-aged females is one that is well-documented in the literature. Programs to address traditionally "female" issues such as anorexia, are commonly found on college campuses nationwide. Our findings suggest that it may be useful to develop gender-specific programs targeted at reducing the general level of stress among undergraduates. Further research should consider the unique sources of stress among college females. Is it that the sources of stress for college females are different, or do college-aged females have distinct, and perhaps less effective ways of handling stress? The answer to this question would facilitate the development of programs that are more effectively targeted to address the particular needs and coping skills of college-aged women and men.

The finding that high levels of stress are associated with other health habits is not startling when considered in the context of the literature on stress within the adult population. In the population at large, higher levels of stress have been related to poor diet, erratic sleep patterns and increased levels of stress-related illness, e.g., heart attacks. High levels of stress have also been linked to a variety of psychological ailments in the college-aged population, e.g., suicide ideation (Hirsch and Ellis, 1996). Further research with college students might document the extent to which "stressed" students experience other sorts of physical illnesses more frequently. It may be useful to understand the long-term effects of stress on students' stamina. It is likely that students experience a series of non-acute ailments, perhaps both physical and psychological, before they seek health care interventions. With an increased understanding of the mechanisms that students use to cope with stress, programs might be better designed to alleviate the effects of stress at an earlier point, before more severe consequences arise.

The relationship between stress, self esteem and health perceptions is strong and clear. What remains unclear is whether higher levels of stress lead to reduced esteem, or whether the pattern works in the opposite direction. It may be, for example, that students seeking to improve their GPA exhibit poor health practices (e.g., reduced sleep, erratic eating habits) and consequently suffer reduced academic performance, leading to reduced levels of esteem and poor health. The opposite may also be true. That is, students in poorer health may lack the stamina

to perform well academically. It might be useful to design programs in time management and coordinating multiple tasks, that are adapted throughout students' college careers in an effort to address specific stressors associated with enrollment in certain years (e.g., seminars on balancing school work and the job search might be offered to seniors). Learning to cope with academic stress will provide students with life-long skills in stress-management that they may employ as they enter the work world.

Further research might also study the stress reduction patterns of students for whom stress is not a concern. How and why are some students able to maintain lower stress levels? What strategies do they use for reducing stress? Are the stressors they experience unique in some way, or are they simply avoiding issues that create stress for other students? Research targeted at understanding the practices and attitudes of these students may provide valuable information that may be used to help students who are more susceptible to stress.

Several additional caveats suggest that the levels of stress we documented among students in our survey may be artificially low. Upperclassmen are clearly over-represented in our sample. It is likely that freshmen experience unique types of stress that could affect our findings. Freshman surely spend greater amounts of energy adjusting to the college environment. They are simultaneously adapting to the social scene, new academic pressures and the need to make decisions with less direct parental input. Such issues are probably not as a great a concern for the upperclassmen we surveyed.

Seniors, however, are also subject to unique types of stress, and they comprise the largest percentage of respondents in our sample. Our survey was distributed in the week following spring vacation. Many seniors were in the midst of finishing large final papers and finalizing career or other post-graduate plans. Thus, the timing at which we administered this instrument may have influenced our findings, as they pertain to seniors. In contrast, the stress levels of other students may have been artificially low when the survey was given. Students typically have few major assignments during this first week after vacation, and most have been relaxing, catching up on sleep and completing assignments. Thus, they may perceive their work load as more manageable than at other time points during the year.

Finally, stress may be institution-specific. We conducted this survey at an Ivy-league university. The perceived level of expectations regarding student performance is high. The majority of the student body will pursue graduate study in some field. The environment here is one that fosters academic and extra-curricular excellence. As such, the prevalence of stress among the students may be exceptionally high, and some of our findings may not be applicable to students in less competitive academic settings.

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