

Spring 5-2016

Relationship Between Health and GPA When Comparing Traditional Undergraduate Students at the University of Maine in Orono

Rachel A. Claussen
University of Maine

Follow this and additional works at: <https://digitalcommons.library.umaine.edu/honors>



Part of the [Health and Physical Education Commons](#), and the [Kinesiology Commons](#)

Recommended Citation

Claussen, Rachel A., "Relationship Between Health and GPA When Comparing Traditional Undergraduate Students at the University of Maine in Orono" (2016). *Honors College*. 378.

<https://digitalcommons.library.umaine.edu/honors/378>

This Honors Thesis is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Honors College by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

RELATIONSHIP BETWEEN HEALTH AND GPA WHEN COMPARING
TRADITIONAL UNDERGRADUATE STUDENTS AT THE UNIVERSITY OF
MAINE IN ORONO

by

Rachel A. Claussen

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Kinesiology and Physical Education)

The Honors College

University of Maine

May 2016

Advisory Committee:

Christopher J. Nightingale, Asst. Prof. of Athletic Training and Phys. Ed, Advisor

Stephen A. Butterfield, Department Chair, Exercise Science and STEM Education

Brian Doore, Director of Assessment

Edith Elwood, Adjunct Assistant Professor, Honors (Sociology)

Sid Mitchell, Associate Professor, Child Development and Family Relations

Abstract

Purpose: The primary relationship this research assesses is between health and academic performance. In addition, it looks at the differences in this relationship for resident students as compared to commuter students.

Methods: The participants were all UMaine undergraduate students. The inclusion criteria for the participants are as follows: 18-24 years old, never have been married, not a Division I athlete and full-time student during the spring semester of 2015. A paper-based self-reported survey was distributed using a convenience sample due to the fact that the primary investigator only asked professors she knew if she could distribute the survey during their class time. SPSS was used for the statistical analyses.

Results: It was found that resident students had higher GPAs than commuters ($p = 0.017$). Also, GPA was associated with perceived stress ($p = 0.029$) as well as perceived health ($p = 0.050$). Additionally, residence was related to the number of hours worked each week ($p = 0.007$) and perceived health ($p = 0.040$).

Conclusion: It can be concluded that living on campus would allow for a higher GPA, decreased stress levels and increased perceived health. However, the commuter student population has been consistently elevated indicating that the University of Maine may need to take action to provide more on campus living for the wellbeing of its students.

Acknowledgements

I would like to thank all of my committee members for their contributions. I especially want to thank Dr. Nightingale and Dr. Doore for their guidance and input for this thesis. Also, thank you to all of my friends and family who helped me throughout this process.

Table of Contents

Introduction	2
Literature Review	5
<i>Introduction</i>	5
<i>Employment</i>	5
<i>Sleep</i>	6
<i>Smoking</i>	7
<i>BMI (Body Mass Index)</i>	8
<i>Perceived stress</i>	9
<i>Physical Activity and MVPA (Moderate to Vigorous Physical Activity)</i>	12
<i>Subjective health</i>	13
<i>Facility Use</i>	13
<i>Conclusion</i>	14
Methods	16
<i>Participants</i>	16
<i>Measures</i>	16
<i>Procedure</i>	16
<i>Description of Statistical Analysis</i>	17
Results	18
<i>Sleep</i>	19
<i>BMI (Body Mass Index)</i>	20
<i>Perceived stress</i>	20
<i>Physical Activity and MVPA (Moderate to Vigorous Physical Activity)</i>	21
<i>Subjective health</i>	23
<i>Residence</i>	25
<i>Facility Use</i>	26
Discussion	28
<i>Limitations</i>	33
<i>Future Research</i>	34
<i>Conclusion</i>	35
List of References	36
Appendix A	40
Author’s Biography	46

List of Figures and Charts

Figure 1: Residential Status of UMaine Students by Academic Year.....	3
Figure 2: Distance From Campus Based on Year in Undergraduate Studies.....	19
Figure 3: Total Number of Hours Exercised Each Week Based on Gender.....	22
Figure 4: Perceived Health Based on Spring 2015 Semester GPA.....	24
Figure 5: MVPA Recommendation Met or Not Met Based on Perceived Health.....	24
Figure 6: NBSRC Use Based on Gender.....	26
Figure 7: Other Facility Use Based on Gender.....	26
Chart 1: Mean Ranks for Kruskal-Wallis H test Concerning Perceived Stress.....	20
Chart 2: Mean Ranks for Kruskal Wallis H test Concerning Perceived Health.....	23

Introduction

“Meeting specific healthy lifestyle recommendations is associated with student’s grade average and thus may influence future success, productivity, and quality of life for college undergraduate students” (Wald et. al 304).

The population being assessed in this research is full-time undergraduate students at the University of Maine (UMaine) who were 18-24 years old during the spring semester of 2015. The inclusion criteria for the participants was that they couldn’t have been married or be Division I athletes. The data was collected during the fall semester of 2015 regarding the preceding spring semester. Students indicated the number of semesters they had completed as a full-time college student, including the previous spring semester. Therefore, it was necessary to subtract a semester in order to determine which year in undergraduate studies they were considered during the spring semester of 2015.

The primary relationship this research assesses is between health and academic performance. This association would be of interest to students wanting to increase their grade point average (GPA). In addition, this survey seeks to determine whether the residence of UMaine undergraduate students plays a role in this relationship. According to the yearly Common Data Set published by the Office of Institutional Research at the University of Maine, the number of commuter students appears to be increasing (Allen and Pratt). If residence impacts academic performance or health measures, the decision to live on or off campus may be affected.

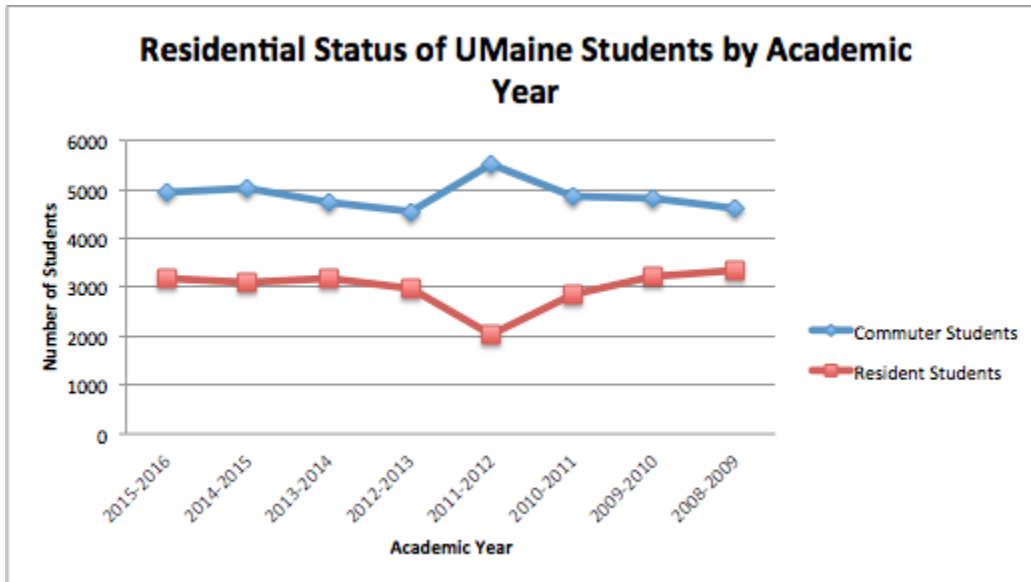


Figure 1: Residential Status of UMaine Students by Academic Year (Allen and Pratt)

Figure 1 shows that there has been an elevated number of UMaine commuter students over the past few academic years. It is expected that those who live on campus will exercise more often due to the fact that they live in close proximity to campus recreation (CR) facilities. Additionally, when looking at participation in club and intramural athletics, Alfano and Eduljee found that residential students are more involved. Additionally, the use of CR facilities has been associated with better exam grades (Slade and Kies), which may provide an academically related benefit to exercise. These relationships are expected to be the same at UMaine.

The Moderate to Vigorous Physical Activity (MVPA) recommendation is cardiovascular exercise performed at either moderate or vigorous intensity at least five days a week. By meeting the MVPA recommendation, a person is more likely to be healthy (Dinger et al.). Those who perceive themselves to have better health tend to be more physically active and have higher GPAs (Keating et al.). Poor BMI has been associated with low grades (MacCann and Roberts), but it appears to have little

correlation to the amount of physical activity performed each week (Keating et al.). It will be interesting to see whether the results are similar for UMaine students.

This research looks at whether there are differences between the other variables assessed by the survey and gender. The literature seems to indicate that females have a higher level of perceived stress (Lehto et al.), whereas males tend to have increased physical activity (Keating et al.). Interestingly, physical activity is associated with less stress (Lehto et al.) so it could be expected that females would have increased stress levels due to exercising less. Additionally, stress is negatively correlated with GPA (Zajacova et al.). Therefore, based on the previously established relationships, it would seem that females should have lower GPAs due to having a higher perceived stress.

Gillen-O'Neel et al. found an association between adequate sleep and better grades. It could be expected to see a similar relationship for the present study because many college students tend to neglect sleep in order to study more (Gillen-O'Neel et al.) resulting in decreased academic performance. One contributor to increased stress levels is having a job (Perna). Curtis and Shani also determined that working longer hours each week is associated with worse grades. Therefore, it could be expected that students who are working while going to school will have a higher level of perceived stress than their nonworking peers. They will also be more likely to have decreased physical activity and lower GPAs. Smoking cigarettes is also linked with higher stress (DeBernardo et al.) and lower grades (Almogbel et al.). Therefore, it is be expected that UMaine students who smoke will demonstrate these relationships. However, UMaine is a smoke free campus making it very possible that there will be few smokers.

Literature Review

Introduction

The following is a review of the literature covering the different aspects of health and student life that may or may not impact semester grade point average (GPA), which is used by this research to assess academic performance. The literature for the impact of subjective health on GPA was lacking. There has also been little research on the impact of residence (on/off campus) in relation to physical health and academic performance. However, the effects of employment, sleep, smoking, body mass index (BMI), perceived stress, physical activity and facility use on academic performance have been well researched.

Employment

Although working while attending college may mean less time for studying, it has been found that “students who work in college earn higher salaries after college” (Perna 285) than those who focus solely on academics. However, working also “reduces the likelihood of completing a degree” (286) due to the fact that it increases fatigue and stress levels. Consequently, those who are employed while enrolled as full-time students are at a disadvantage compared to their non-working peers. It is important to note “working more than 10 hours per week off campus is associated with lower grades for both full- and part-time students” (86). However, students who work on campus, up to 20 hours a week, tend to have more “effective educational practices,” which typically lead to higher GPAs compared to those who work off campus (285). The five categories of “effective educational practices” (285) are “academic challenge,” “active and collaborative learning,” “student-faculty interaction,” “enriching educational experiences” and

“supportive campus environment” (Perna 183). These categories were determined by the 2008 administration of the National Survey of Student Engagement. (Perna)

In a survey of 359 undergraduate students, 55% of whom worked, it was found “that working adversely affects various aspects of academic life and that working longer hours is associated with reduced academic performance” (Curtis and Shani 134).

According to the authors, “Lecturers . . . give part-time students as much consideration . . . as possible when work . . . crises impinge upon their studies” but “this understanding is often not extended to full-time students” (136) despite the fact that both full and part time students work. However, there are students who find that employment helps, more than hurts them. Some of the ways in which working can be beneficial are that students can “afford to study”, “[work] in the . . . sector which” they “want to pursue as a career”, have “a break from college work”, and they obtain “valuable work experience” (136).

In a different survey there were 108 participants, all of whom were college students and 65.7% of whom lived on campus. Interestingly enough, Alfano and Eduljee found that GPA and the number of hours worked each week are not correlated. As a result, they suggest that “further research be conducted to understand the relationship between work, levels of involvement and academic performance between residential and commuter students” (Alfano and Eduljee 341).

Sleep

“Academic pressure may often put university students under stress, resulting in undesired consequences such as sleep deprivation” (Lehto et al. 212). It is well known that “sacrificing sleep . . . is a . . . counterproductive strategy” (Gillen-O'Neel et al. 141) that should be avoided due to its profound negative impact on students' concentration

during the school day and their academic performance. The longitudinal study conducted by Gillen-O'Neel et al. consisted of 535 high school students, of whom 52.1% were female. After receiving written parental consent, the researchers gave the students a survey every year or every other year, depending on which of the three schools they were in. The researchers found that oftentimes students will wait to study until later in the day due to numerous commitments. By reducing time spent on other activities throughout the day, students can allow more time for schoolwork and also avoid skipping out on sleep (Gillen-O'Neel et al.). It seems that the majority of students in high school neglect many aspects of health in order to create time for homework and studying. This tends to be the case for college students as well. Gillen-O'Neel et al. found that each student, on average, spent "just over an hour studying each school night," however "sleep time . . . decreased over the course of high school" (Gillen-O'Neel et al. 136). They claimed that this occurrence is due to a "trade-off between daily study time and sleep" (Gillen-O'Neel et al. 139).

Chiang et al. administered a survey to 172 undergraduate college students in their sophomore, junior and senior year. The majority of the participants were working (68%), 18-24 years old and white. They found that "sleep loss was negatively correlated with academic performance" (Chiang et al. 74), which supports the findings of other research in the literature.

Smoking

"The times of greatest pressure for students are . . . when coursework assignments are due to be handed in or the examination period is looming" (Curtis and Shani 136). Cigarettes are most often used in an effort to reduce stress, however smokers "report

feeling slightly more stressed than nonsmokers” (Parrott 817). According to numerous studies, “quitting leads to a significant reduction in self-reported stress” (Parrott 818). However, “the addictive nature of nicotine and the perceived ‘positive’ effects of tobacco use reported by smokers make smoking cessation problematic” (DeBernardo et al. 62).

“Psychologically, smokers may exhibit personality characteristics different from those of nonsmokers” (DeBernardo et al. 61). In addition, the personality type of a smoker can indicate what causes them to smoke. Evidence “suggests that . . . introverts may be more prone to smoke to relieve tension and stress” (DeBernardo et al. 61). They surveyed 5,398 college students, 51.4% of whom were male. In this study, they found a “smoking prevalence of 13.4%” (DeBernardo et al. 64) among students. However another study found that “twenty-nine percent of . . . college students reported they were current cigarette smokers” which “is consistent with those of other national studies” (Everett et al. 59). Everett et al. surveyed 2,857 college students between the ages of 18 and 24 years old about their smoking habits including at what age they began smoking.

A previous study looked at 467 students at three different colleges in Saudi Arabia, 30.9% of whom were smokers. They found that “students with lower grades . . . have a 2.3 times greater likelihood of being smokers compared with those who had higher . . . grades” (Almogbel et al. 911).

BMI (Body Mass Index)

Although “intelligence test scores for obese students [do] not differ from healthy-weight students” (MacCann and Roberts 42), there is a significant difference in GPA in relation to BMI. MacCann and Roberts believe that the difference in grades received by the overweight/obese may be due to discrimination. “Teachers may award lower grades

to overweight and obese students based on a holistic judgment or attitude toward the student” due to the fact that “a substantial proportion of adolescent educators hold negative beliefs about obese people” (MacCann and Roberts 45). They think “that obese workers cannot be successful, . . . are untidy and that becoming obese is one of the worst things that can happen to a person” (MacCann and Roberts 45). They studied 1,034 college students from 24 colleges, 64% of whom were female.

Kobayashi surveyed 57 American college students, 31 of whom were female, 19.8 was the average age and 25.5 was the average BMI. He also looked at 72 Japanese college students, 38 of whom were female, 21.2 was the average age and 21.2 was the average BMI. He mentions, “animal studies [have] already found that [a] high-fat diet style [leads] to a decline in both learning and memorizing functions of the animals” (Kobayashi 556). He speculates that the correlation between eating foods high in fat and diminished intellectual function could be the same for humans (Kobayashi). Since “a high-fat diet pattern increases the . . . risk of being overweight” (Kobayashi 556), BMI may then be negatively correlated with academic performance.

Keating et al. surveyed 903 college students, 63.9% of the participants were female, 38.3% were overweight or obese, 81% perceived their health to be very good or good, and 38.7% had a GPA of A- or higher. The research done by Keating et al. also demonstrated that BMI and GPA are negatively correlated. However, there was no difference between BMI and amount of physical activity (PA).

Perceived stress

At some point in time, students will experience stress. “Typical college stressors” are “exams, papers, finances, and being overcommitted” (Ramsay et al. 16). It has been

found that having a higher level of perceived stress may “have a negative influence on GPA” as well as “staying enrolled” (Zajacova et al. 696). It may be that having lower grades results in increased stress, which may cause some students to discontinue their education (Zajacova et al.). The sample used for the study was 107 first-semester freshmen, 73% of whom were female.

In another study Lehto et al. surveyed 407 college students and 57.4% of the participants were female. It was found that “female students exhibit a higher level of stress than male students” (Lehto et al. 213). They noticed that “women tend to rely on more ‘expressive’ coping strategies” whereas males use “physical coping resources such as sports” (Lehto et al. 213). Lehto et al. determined that “artistic and culturally oriented activities”, such as the ones normally used by females “may be more effective in reducing stress induced by unexpected changes in students’ lives” (213). However, it may not positively impact the stress related to academics (Lehto et al.).

Interestingly enough, academic major plays a role in the level of perceived stress. May and Casazza conducted a survey of 265 college students in their third, fourth or fifth year and 62% of the participants were female. They used a 5-point Likert scale called the PSS-10 to assess perceived stress. They found that “hard science majors experienced a significantly higher level of perceived stress than soft science academic majors” (May and Casazza, 270).

A ‘hard’ science academic major was classified as any major which curriculum required at least 6 courses of any combination of math, chemistry, or biology courses [while] a ‘soft’ academic major was classified as any major which curriculum required fewer than 6 courses of

any combination of math, chemistry, or biology courses. (May and Casazza, 266)

The correlation between being a “hard science major” and having “higher stress levels . . . may be due to the greater number of math intensive classes that are required for these majors” (May and Casazza, 271).

Lehto et al. found that “when facing imminent academic pressure such as impending tests and assignments, students tend to resort to reducing sports time” due to the fact that they see it “as a convenient sacrifice” (212). However, “previous literature has provided evidence that participation in physical activities is associated with lower levels of perceived stress” (Lehto et al. 212). “The amount of hormones associated with stress” is reduced through “physical activity participation” due to improved “physiological functioning” (212). Despite this trend, “it is . . . a questionable strategy to reduce physical activities such as sports due to the fact that sports participation has been consistently related to the improvement of negative psychological states such as stress” (Lehto et al. 212).

In another study, it was determined that although “the group of students with a lower GPA reported greater stress” (Geslani and Gaebelein 1464); “both exercisers and non-exercisers reported similar” (1466) perceived stress. This finding does not line up with other research in the literature about the effects of exercise on perceived stress. Li and Lindsey also found “that no differences were observed when both lower and higher stressed students engaged in” “physical activities” “with equal frequency” (446). However, they noticed “gender plays a role in health promotion practices among college students” (Li and Lindsey 437).

Physical Activity and MVPA (Moderate to Vigorous Physical Activity)

“It is well documented that a sedentary lifestyle tends to lead to a number of health problems” (Keating et al. 163). Keating et al. used multiple regressions to find that “those who [perceive] their health as better are more likely to have more PA” (170) or physical activity. However, they were unable to determine if having a good perceived health is a cause of increased PA. They also found that “GPA was not a predictor for student PA” (Keating et al. 170). Since “PA differences in year in university were not significant” (170) Keating et al. were led to believe that the “university has failed to increase student PA” (Keating et al. 170) as it should. Surprisingly Keating et al. also found that “females had less PA than males” (169). This is a trend that has been noted in other literature as well. Keating et al. finds this “gender disparity” (169) to be of concern due to the fact that “females . . . play a critical role in their children’s PA participation” (169).

Dinger et al. surveyed 67,861 college students, 68% of whom were female. The majority were 18 to 20 years old, had healthy BMIs and did not work for pay. It was found that “meeting the current MVPA recommendation was positively associated with . . . positive perception of general health status, healthy BMI . . . not smoking cigarettes, and adequate sleep most days of the week” (Dinger et al. 72). The study done by Wald et al. wound up “demonstrating an association between academic achievement”, “physical activity, and sleep” (303). They surveyed 16,095 college students, 70.3% of whom were female and 66.5% had a desirable BMI.

VanKim and Nelson determined that “students who met vigorous PA recommendations in college were less likely to report poor . . . perceived stress than

students who did not meet recommendations” (12). Therefore, it is imperative to create “environments where students can easily engage in PA” because it “may help prevent decreases” in PA which tend to occur after “high school” (VanKim and Nelson 13). They studied 14,706 college students, 63% of whom were female.

Subjective health

In one study, the researchers were attempting to determine whether increased perceived stress leads to a higher number of health complaints (Ansari et al.) They administered a survey that asked about health complaints and assessed perceived stress using the Cohen’s Perceived Stress Scale. Ansari et al. found that there is a correlation between perceived stress and the way a person views his/her health. Stress can result in “having a higher frequency of symptoms” that are “associated with poorer subjective health” (Ansari et al. 78).

In a study mentioned previously, “GPA was . . . significantly correlated with perceived general health” (Keating et al. 168). Better perception of health is linked to increased physical activity (Keating et al.). Dinger et al. found that “students who reported good to excellent general health had . . . greater odds of engaging in sufficient amounts of MVPA compared with those who reported fair or poor general health status” (72). As mentioned previously, meeting the recommendation for MVPA often results in a better GPA as compared to those who do not meet the recommendation (Dinger et al.).

Facility Use

Interestingly enough, the study conducted by Keating et al. “did not find living on campus as a significant predictor of student PA” (170) despite closer proximity to on

campus recreation facilities. In a study done by Slade and Kies, it was discovered “that those who use” campus recreation (CR) “facilities . . . tend to do better on exams” (7). They measured use of CR facilities and found that “an increase of five CR visits in a 21 day period [corresponds] to an increase in exam scores of . . . 1 percentage point” whereas “those who decreased their CR visits by five . . . [decreased] their exam score[s] by . . . 1 percentage point” (Slade and Kies 7) these findings indicate a relatively weak correlation between test scores and use of CR facilities. Their study looked at 408 traditional first-year medical students over the course of 4 years, 56.6% of whom were male. Therefore, “students who perform poorly on an examination” (Slade and Kies 7) should not “stop visiting CR facilities in an effort to devote more time to studying”, but instead routinely visit the recreation facilities due to the increased probability of achieving higher grades.

Conclusion

There were several key relationships found between different aspects of health or student life and academic performance. First, it was determined that although working increases stress levels, it leads to higher pay after college and working on campus is actually associated with better study habits than working off campus (Perna). However, working longer hours each week is associated with worse grades (Curtis and Shani). Additionally, adequate sleep is correlated with better grades and neglecting sleep in order to study more is worse for academic performance (Gillen-O'Neel et al.). Students should reduce other time commitments during the day to allow for more study rather than reducing sleep time (Gillen-O'Neel et al.). Stress is linked with smoking especially for

introverts (DeBernardo et al.). Also, smoking actually increases stress (Parrott) and is associated with lower grades (Almogbel et al.).

Interestingly, BMI is associated with low grades, but not low intelligence (MacCann and Roberts). BMI appears to have little correlation to the amount of physical activity performed each week (Keating et al.). Another study found that stress was negatively correlated with GPA (Zajacova et al.) and hard science majors are more likely to experience increased stress due to an increased number of math courses (May and Casazza). Not surprisingly, physical activity is associated with less stress (Lehto et al.). In addition, having better subjective health and being male is associated with increased physical activity (Keating et al.). Furthermore, meeting the MVPA recommendation is associated with better overall health (Dinger et al.). It has also been found that better adequate sleep and physical activity are associated with improved academic performance (Wald et al.). Also, having better subjective health tends to be correlated with a higher GPA (Keating et al.).

Living on campus has not been found to be a significant predictor of physical activity despite residents having easier access to exercise facilities (Keating et al.). It has been found that using campus recreation facilities is associated with better exam grades (Slade and Kies). Finally, resident students as a whole tend to participate in more club and intramural athletics than commuters (Alfano and Eduljee). Further research is needed in order to understand the impact of work and residence on academic performance (Alfano and Eduljee).

Methods

The University of Maine Institutional Review Board approved the procedures and measures for this research. The eligibility requirements and purpose of the survey were verbally explained to each group of prospective subjects.

Participants

Subjects were full-time UMaine students who were 18 to 24 years old, not Division I athletes, and have never been married.

Measures

A self-reported survey was utilized to measure physical health and academic performance. By distributing a paper-based survey, the likelihood of getting students to participate increased because it could be completed during class time. There were 20 questions about physical health, academic performance and demographics. The survey is included in Appendix A.

Procedure

The primary investigator contacted professors on campus about administering the survey in their classes. She read the recruitment script that was approved by the IRB. She told students that by submitting the survey they are giving their consent to participate in her research. The surveys were anonymous. Responses were recorded on an Excel spreadsheet which was password protected and then stored on a USB flash drive. The flash drive was kept in a lockbox for safekeeping. It was only removed from the lockbox to add more data or do statistical analyses.

Description of Statistical Analysis

The program SPSS was used for all data analyses. Four different tests were selected to complete the statistical analyses. The first one was a One-Way ANOVA with a Tukey HSD Post Hoc test in order to compare more than two groups with numerical variables. The Post Hoc test was chosen because it presents the differences between each group that is compared in the ANOVA. The next test was a two-tailed Independent Samples T-Test. This test allowed for the comparison of two groups with numerical variables. The third test was a linear regression. The last test that was used was a Kruskal-Wallis H test, which is the nonparametric equivalent of an ANOVA. It allows for the comparison of more than two groups with ordinal variables.

Results

Of the 272 completed surveys, one was deemed ineligible because the participant was not between 18 and 24 years old. Of the 271 remaining participants, 208 (76.8%) were female and 63 (23.2%) were male. Last year, 52% of all 9,339 UMaine undergraduate students were female and 48% were male according to U.S. News. However, the U.S. News count also included part-time undergraduate students. Assuming that the female to male ratio of full-time students is similar to the one presented by the U.S. News, the sample in this research was unable to obtain an accurate representation of the population being assessed ("University of Maine | Best College | US News").

Race was not assessed in this research due to the fact that 78.1% of UMaine undergraduate students were Caucasian during the 2014-2015 school year (Allen). The average age of the sample was 19.31 years ($SD = 20.79$) and only surveys completed by 18 to 24 year olds were accepted. Of the 271 participants, 265 indicated the number of semesters they completed as of Fall 2015, which excluded summer semesters. 45 (17.0%) completed 0-1 semesters, which indicated that during the spring semester they were high school seniors. 100 (37.7%) completed 2-3 semesters, which indicated that they were first years. 73 (27.5%) completed 4-5 semesters, indicating that they were sophomores. Forty-one (15.5%) marked that they had completed 5-6 semesters, indicating that they were juniors. Five (1.9%) of the participants completed 7-8 semesters, which indicated that they were seniors and 1 (0.4%) participant had completed 9-10 semesters, making them a fifth year.

It is important to note that this response indicated the year in college students were during the spring semester of 2015. For the Results section, the significant

relationships between high school seniors and undergraduate students have been omitted due to the fact that students in high school do not live in the same environment as undergraduate students.

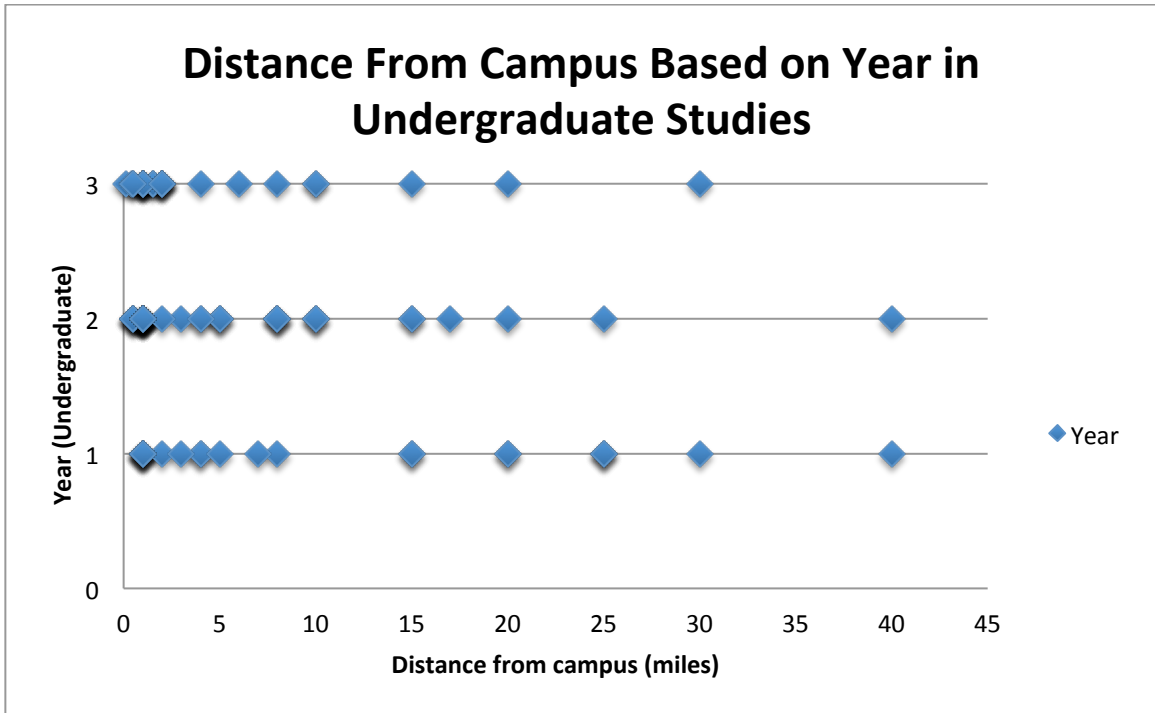


Figure 2: Distance From Campus Based on Year in Undergraduate Studies

It was found, using a One-Way ANOVA, that first years lived much further away from campus than juniors due to a handful of students who lived further than 10 miles away: $F(3,111) = 3.461$, $p = 0.019$. Figure 2 shows that there were a few statistical outliers for first years, which may have impacted the results of the One-Way ANOVA.

Sleep

A Kruskal-Wallis H test was performed and showed that there was a significant relationship between perceived stress and the amount of sleep a person gets each night ($X^2(5) = 14.628$, $p = 0.012$). The mean rank was 204 for “no stress”, 124.94 for “little stress”, 112.45 for “moderate stress”, 116.77 for “some stress”, 147.43 for “a lot of

stress” and 109.5 for “tremendous stress”. This relationship shows that a lower perceived stress is linked with increased nightly sleep, generally.

BMI (Body Mass Index)

A relationship was found between the participants’ perceived general health and their BMI using a Kruskal-Wallis H test ($X^2 (3) = 19.211, p < 0.001$). There was a mean rank of 181 for “bad” overall health, 108.51 for “okay” overall health, 131.28 for “good” overall health and 160.35 for “excellent” overall health. Generally, perceived general health decreased as BMI increased.

Perceived stress

Factor	No Stress	Little Stress	Some Stress	Moderate Stress	A Lot of Stress	Tremendous Stress
Perceived Health	21	140.28	158.73	126.03	143.61	94.05
Gender	32	76.83	121.67	133.41	146.03	154.27
Total Hours Exercised Weekly	204	124.94	112.45	116.77	147.43	109.5

Chart 1: Mean Ranks for Kruskal-Wallis H test Concerning Perceived Stress

By performing a Kruskal-Wallis H test, it was found that perceived stress and the participants’ perceived general health were correlated ($X^2 (5) = 15.607, p = 0.008$).

Additionally, it was found that stress and gender had a significant relationship ($X^2 (5) = 19.037, p = 0.002$). Perceived general health was worse when the level of perceived stress increased, in general. There was also an association between perceived stress and the

total number of hours exercised each week ($X^2(5) = 12.193, p = 0.032$). In general, participants who had a higher perceived stress exercised less than those who had lower stress levels. Finally, a significant relationship was found between stress and GPA using a linear regression ($R^2 = 2.783, F(3) = 3.049, p = 0.029$). As the level of perceived stress increased, GPA decreased.

Physical Activity and MVPA (Moderate to Vigorous Physical Activity)

The physical activity variables that were found to be significantly different when performing an Independent Samples T-Test between genders were participation in club and intramural sports, days exercised each week, number of days during which vigorous, moderate and low intensity exercise was performed, and the total number of hours exercised each week. It was found that males participated in many more sports than females: $t(77.468), p < 0.001, d = -0.69$. Additionally, males exercised more days each week: $t(266) = 3.378, p = 0.001, d = -0.49$, did slightly more vigorous exercise: $t(267) = 2.218, p = 0.027, d = -0.32$, did a lot more moderate exercise: $t(83.313) = 3.919, p < 0.001, d = -0.66$, and slightly more low intensity exercise: $t(255) = 2.349, p = 0.020, d = -0.33$.

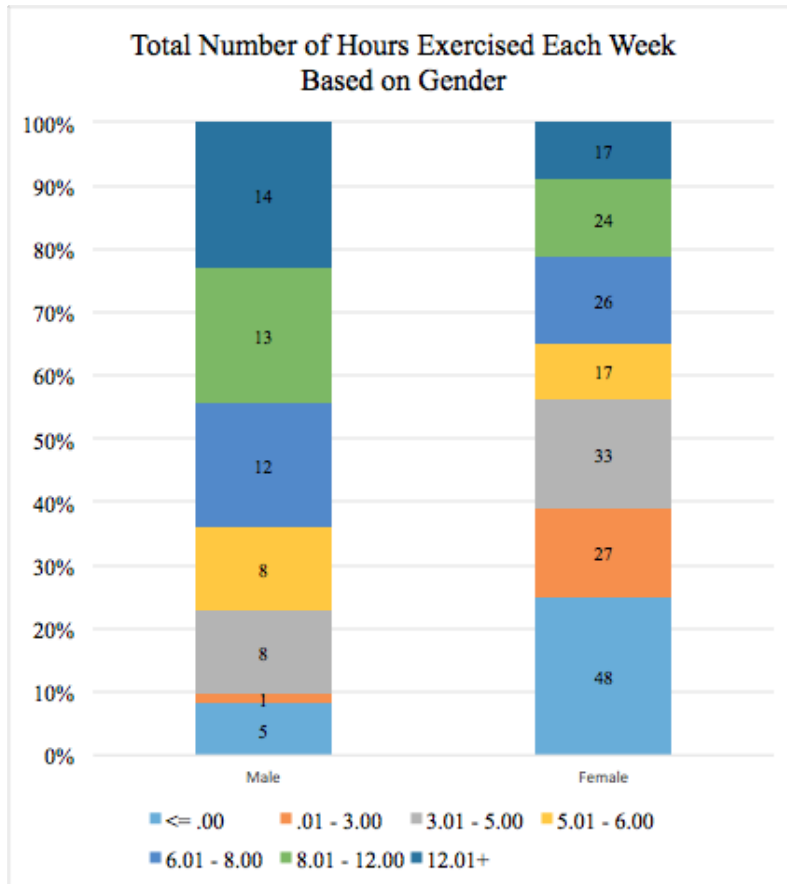


Figure 3: Total Number of Hours Exercised Each Week Based on Gender

It was also found that males exercised more total hours each week: $t(71.476) = 3.601, p = 0.001, d = -0.71$. Figure 3 demonstrates this finding as well as the fact that 25% of all females do not exercise at all compared to only 8% of males.

After performing a One-Way ANOVA, there were significant differences found between year in college and the following variables: number of days exercised each week and participation in club and intramural sports.

This research determined that first years engaged in less club and intramural sports than sophomores: $F(3,258) = 5.932, p = 0.006$. First years also engaged in slightly less club and intramural sports than juniors: $F(3,258) = 5.932, p = 0.020$.

Subjective health

Factor	Bad Perceived Health	Okay Perceived Health	Good Perceived Health	Excellent Perceived Health
Gender	165.5	138.7	139.9	111.38
Total Hours Exercised Weekly	90.50	94.75	123.52	158.92
Age	163.33	104.09	130.21	165.34
GPA	90.5	111.47	141.62	128.17
MVPA Recommendation	95.5	122.3	130.13	159.92
Use of NBSRC	46.5	94.58	127.08	155.51
Use of DeMeritt Forest Trails	156.33	119.21	124.49	141.36
Use of Bike Paths	141	106	127.37	141.32
Use of Mahaney Dome/Sports Fields	107.5	122.68	123.57	145.07

Chart 2: Mean Ranks for Kruskal Wallis H test Concerning Perceived Health

There were several relationships found between a participant's perceived general health and the other variables that were assessed in this research. A Kruskal-Wallis H test was used when comparing subjective health with the other variables. There was an association between health and gender ($X^2(3) = 11.384, p = 0.010$). This shows that males perceived their health to be better than females. Health and the total number hours exercised each week were significantly related ($X^2(3) = 17.396, p = 0.001$). This shows

that exercising more each week is related to perceiving health to be better. Additionally, health and age were significantly related ($X^2(3) = 15.669, p = 0.001$).

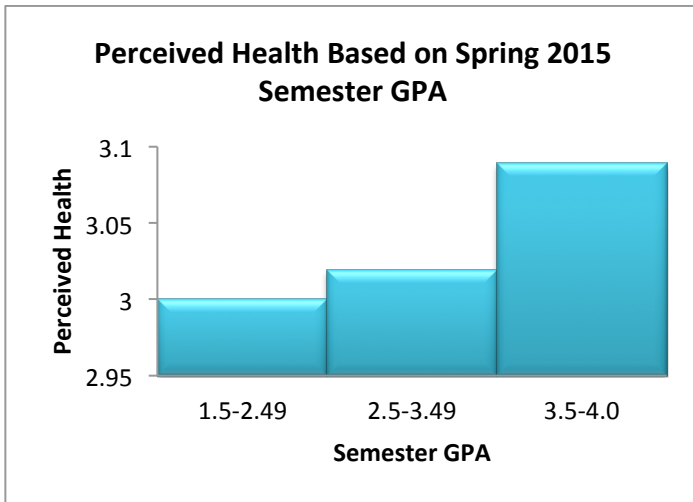


Figure 4: Perceived Health Based on Spring 2015 Semester GPA

Health and GPA had a significant relationship as well ($X^2(3) = 7.903, p = 0.050$).

Figure 4 shows that students who perceive their health to be better also have higher GPAs.

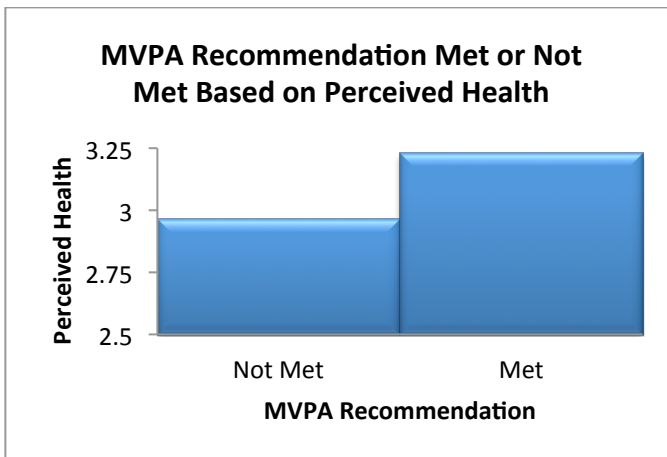


Figure 5: MVPA Recommendation Met or Not Met Based on Perceived Health

There was also a correlation between health and meeting the MVPA recommendation ($X^2(3) = 12.580, p = 0.006$). Figure 5 demonstrates that meeting the MVPA recommendation is linked with having a better perceived health.

There were relationships between the use of a few facilities and participants' perceived general health. An association was found between health and the use of the NBSRC ($X^2(3) = 17.931, p < 0.001$). Additionally, the use of the DeMeritt forest trails and health were related ($X^2(3) = 11.438, p = 0.010$). The participants' perceived general health and use of the bike paths was also linked ($X^2(3) = 9.764, p = 0.021$). Finally, a relationship between health and the use of the Mahaney Dome/sports fields was also found ($X^2(3) = 9.220, p = 0.027$). In general, using CR facilities was related to having a better perceived health.

Residence

An Independent Samples T-Test was performed to look at the relationship between residence and other variables. One of the significant findings was between residence and GPA ($t(210.382) = 2.404, p = 0.017, d = 0.32$). This test showed that residents had slightly higher GPAs than commuters. The other association was between residence and the number of hours worked each week ($t(194.961) = 2.742, p = 0.007, d = -0.38$). It was found that residents work somewhat less than commuter students. Additionally, a Kruskal-Wallis H test was performed that showed a relationship between a participant's perceived general health and their residence ($X^2(1) = 4.236, p = 0.040$). There was a mean rank of 110.10 for residents and 114.29 for commuters.

Facility Use

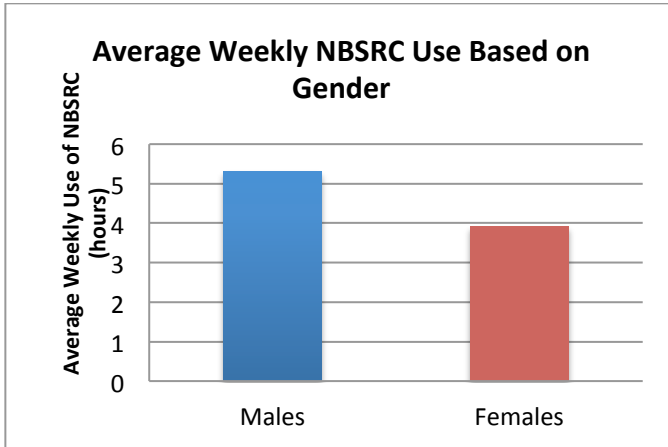


Figure 6: NBSRC Use Based on Gender

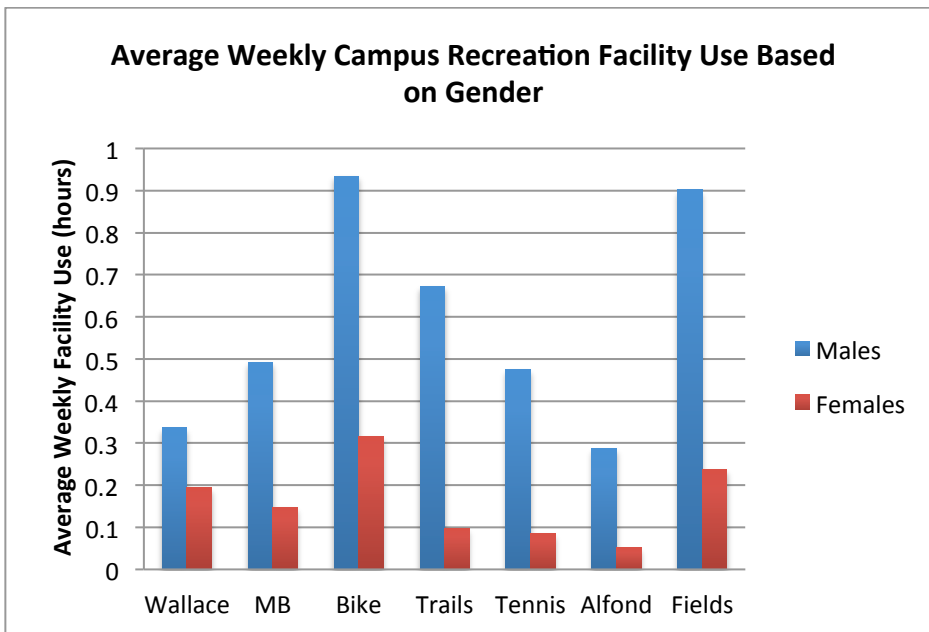


Figure 7: Other Facility Use Based on Gender

This research determined a significant relationship between gender and the use of the following facilities: New Balance Student Recreation Center (NBSRC), DeMeritt Forest trails and sports fields/Mahaney Dome. Any significant differences concerning other on campus and off campus facilities that are not displayed in figure 6 were omitted due to lack of sufficient data. Figures 6 and 7 show that across the board, males use CR facilities more than females.

It was found that males used the NBSRC slightly more than females: $t(255) = 2.349$, $p = 0.020$, $d = -0.34$. As figure 6 shows, the most used Campus Recreation facility was the New Balance Student Recreation Center. Males used the DeMeritt Forest trails more hours each week than females: $t(61.604) = 2.388$, $p = 0.020$, $d = -0.45$. Additionally, males used the sports fields/Mahaney dome more often: $t(68.521) = 2.683$, $p = 0.009$, $d = -0.56$.

Discussion

This research found that the sample had several first years who live further away from campus than would be typically expected. When the One-Way ANOVA test was performed, the Tukey HSD test indicated that first years live further away from juniors ($p = 0.012$). However, the University of Maine requires first years to live on campus unless they live nearby. One possible explanation is that the university made several exceptions to this rule.

After conducting another One-Way ANOVA, a difference was found for club and intramural sport participation between first years and sophomores, as well as first years and juniors. Interestingly, first years engaged in fewer sports than both sophomores ($p = 0.006$) and juniors ($p = 0.020$). The study conducted by Keating et al. found that the amount of physical activity a student engages in does not correlate with their proximity to CR facilities. It seems as though this survey had a similar finding in that first years typically live closer to campus than sophomores and juniors, so it would be predicted that they would engage in more sports on campus. However, in this sample since first years were found to live further away in the present research, this did not hold true. This situation makes it more difficult to determine whether residence plays a role in sport participation.

Conducting an Independent Samples T-Test indicated that there was not a significant difference between the amount of physical activity performed and year at UMaine. Keating et al. had the same finding and they believed that this was due to the fact that their university wasn't promoting engagement in physical activity. It was surprising that although there were differences in sports participation, there weren't any

for the number of days or hours exercised. In addition, there was nothing that would indicate that residence impacts the use of campus recreation facilities.

This research found that males participate in more physical activity than females for both sports as well as the number of hours exercised each week. In a study conducted by Keating et al. it was also found that males had more PA than females. It is possible that males exercise more often because this is a method that effectively reduces academic stress, whereas females tend to use stress reduction strategies that relate to sharing their thoughts and feelings (Lehto et al.). Additionally, these researchers found that females tend to have higher stress levels than males. It is then possible that since females experience more stress and are not coping with it properly, they would be less likely to exercise due to perceived lack of time when schoolwork is demanding.

By conducting a one-way ANOVA, the Post Hoc tests showed that there was a statistically significant difference between gender and facility use, and males were more apt to regularly use the CR facilities. In the research done by Slade and Kies, they found that the use of CR facilities improves test grades. The only factor of academic performance that was assessed in this research was semester GPA.

Due to the fact that there was not a large difference of hours worked between commuter and resident students ($p = 0.007$, $d = -0.38$), it is unlikely that there are many differences between the two groups for other variables that are linked with working longer hours. Although working has been found to impact GPA as well as other academic factors (Curtis and Shani). This research did not look at part-time students, so the consideration that professors often give to this group more so than full-time students with jobs did not play a role in my results.

Interestingly, there was no relationship between employment and any variable other than residence. This occurrence was unexpected due to the fact that working has been associated with increasing stress, decreasing GPA if working off campus, and reducing the chance that a student will graduate from college (Perna). However, the results of this research concerning the lack of a correlation between GPA and the number of hours worked is supported by previous studies mentioned in the literature review.

It was expected that there would be a relationship between perceived stress and the amount of sleep a student gets on average each night due to the fact that students will reduce sleep in times of stress (Lehto et al.). Since this research did find an association was found between stress and sleep ($p = 0.012$), it would be ideal to begin increasing students' awareness that not managing their stress can lead to less sleep. Although many college students may be aware of this occurrence already, it could be beneficial to provide more stress outlets for college students and teach them how to handle stress so that they are able to get adequate sleep each night.

Despite findings in previous literature, this research did not find a relationship between sleep and stress, exercise, BMI, smoking or GPA. The research conducted by Gillen-O'Neel et al. and Chiang et al. found that there was a strong association between the amount of sleep a student gets and their GPA. Additionally, Dinger et al. found that having a normal BMI and not smoking are highly correlated with getting enough sleep. Wald et al. discovered that physical activity and sleep have a strong correlation. Therefore, it was unexpected that this research would find no differences based on sleep.

There were also no significant relationships found between smoking and any other variable since only four of the participants reported smoking regularly. I believe that the low number of smokers is due to the fact that UMaine is a tobacco free campus.

The association between the participants' perceived general health and BMI ($p < 0.001$) was supported by one of the articles presented in the literature review. The study completed by Kobayashi speculated that having a high fat diet would increase body weight and the risk of having a high BMI. Unfortunately, no other relationships were found to be significant when considering BMI despite the fact that previous work suggests otherwise. Dinger et al., MacCann and Roberts, and Keating et al. found that MVPA, smoking, sleep and GPA were related to BMI.

Higher stress levels have been linked with lower perceived general health (Ansari et al.). This research also found that stress and perceived health are related ($p = 0.008$). Although stress is a part of mental health, it appears that it can have an impact on college students' physical health.

Lehto et al. as well as Li and Lindsey have found that gender plays a role in perceived stress. Female students tend to have higher stress levels potentially due to the fact that the way they deal with stress doesn't alleviate the stress caused by schoolwork (Lehto et al.). Males resort to sports and exercise, which have been linked to decreasing academic stress (Lehto et al.). This could explain why this research found a difference between gender and level of perceived stress ($p = 0.002$).

This research also determined that there is a relationship between the total number of hours exercised each week and level of perceived stress ($p = 0.032$). Lehto et al.'s research supports this finding because they found that reducing the time spent exercising

results in increased stress. Therefore, there may be a link between stress and exercise due to the fact that males exercised more and had lower stress levels. Additionally, there is an association between stress and GPA using a linear regression ($R^2 = 2.783$, $F(3) = 3.049$, $p = 0.029$). As the level of perceived stress increased, GPA decreased.

Keating et al. concluded that the university they were studying was not effective at getting students physically active due to the fact that there were no significant differences in PA based on year (Keating et al.). However, this research found that there was in fact a difference in sports participation between first years and sophomores ($p = 0.006$) as well as between first years and juniors ($p = 0.020$). Based on these results, it would be difficult to conclude whether UMaine is effectively pushing for increased physical activity.

This research determined that resident students participated in more sports than commuters ($p = 0.042$), which could relate to the fact that commuter students have to travel a further distance to reach the areas where intramural and club sports are held. Keating et al. didn't find that living on campus had an impact on whether a student would engage in physical activity. Despite the lack of prior research, it does not seem unlikely that residents would participate in more sports.

Health and gender were significantly related ($p = 0.010$). However, none of the previous studies in the literature review indicated that there would be a difference between perceived health and gender.

It had been anticipated that health and exercise would be related due to the findings of Keating et al. In this research, health and total hours exercised were significantly related ($p = 0.001$) as well as health and the use of the NBSRC ($p < 0.001$),

DeMeritt forest trails ($p = 0.010$), bike paths ($p = 0.021$) and the Mahaney dome/sports fields ($p = 0.027$). In the study conducted by Keating et al., they were not able to find whether a positively perceived health actually causes increased PA.

Health was also significantly related to meeting MVPA recommendations ($p = 0.006$), which is supported by the fact that Dinger et al. found that by meeting MVPA recommendations makes students more likely to have a positive perceived health. By having a better perceived health it would then be expected that a student would have a better GPA since meeting the MVPA recommendation is associated with better health (Dinger et al.). The relationships between health and age ($p = 0.001$) and between health and year ($p = 0.022$) had not been anticipated due to lack of evidence from previous research.

This research determined that residents had slightly better GPAs than commuter students ($p = 0.017$). It's possible that sports participation could play a role in this GPA difference since residents participated in more sports, which is associated with reduced stress. It was not anticipated that there would be an association between perceived health and residence due to lack of prior research. However, my statistical analyses showed that these two factors are related ($p = 0.040$). Finally, there was no relationship found between gender and GPA despite differences in facility use, total hours of exercise, perceived health and perceived stress.

Limitations

This research was limited by the way in which participants were selected and the way factors were measured. By using a self-reported survey, it makes it difficult to tell

how accurately the participants are evaluating their health and academic performance. In addition, the primary investigator only surveyed classes within the College of Education and the participants were mostly female. Therefore, the sample cannot be an accurate representation of UMaine undergraduate students as a whole.

Future Research

In order to determine whether stress reduction is the driving force behind why more males exercise, it would be necessary to conduct another survey of UMaine students. Also, it would also be beneficial to ensure that the sample more closely reflects the major and gender ratios of the student population since the current sample was predominantly female and in the College of Education. It may be beneficial to conduct another study that looks at test scores as well to determine whether it's possible to impact course grades by increasing the use of CR facilities.

Further research should attempt to use a more accurate measurement than having the participants select their BMI off of a chart. The participants should indicate their height and weight and the investigator should calculate the BMI based on the values provided. There should also be a focus on physical activity and sports participation in a longitudinal study to see if changes occur, as students get older. It would be advisable to do a follow-up study to determine whether the relationships found in this research still holds true for a more diverse sample of college students. Also, it would be suggested that future research look into how residence impacts health. It would be advisable to conduct future research that more accurately assesses GPA in order to determine whether there are, in fact, any associations between health factors and GPA. Additionally, it could be

beneficial to look at whether the use of CR facilities can influence test scores as seen in the literature.

Conclusion

There were a few major findings that pertained to the two main relationships that this research was assessing. It was found that resident students had higher GPAs than commuters ($p = 0.017$). A higher GPA was associated with lower perceived stress ($p = 0.029$) as well as better perceived health ($p = 0.050$). Additionally, residence was related to hours worked each week ($p = 0.007$) and perceived health ($p = 0.040$). If further research is conducted and these relationships hold true, it would be important for UMaine to take several steps in the interest of its students' wellbeing and academic achievement. First, UMaine should increase on campus housing since being a resident student is linked with having a higher GPA. Additionally, the university should promote the importance of adequate stress, proper stress management and physical activity. There should also be a focus on females regarding stress and exercise since it was found that they had a higher perceived stress and less physical activity than their male counterparts. Making these adjustments should allow UMaine students to become both healthier and more successful academically.

List of References

- Alfano, Halley J., and Nina B. Eduljee, PhD. "Differences in Work, Levels of Involvement, and Academic Performance between Residential and Commuter Students." *College Student Journal* 47.2 (2013): 334-42. Web. 17 Feb. 2015.
- Allen, Debra. *Common Data Set 2015-2016*. Orono: University of Maine, n.d. PDF.
- Allen, Debra. *Common Data Set 2014-2015*. Orono: University of Maine, n.d. PDF.
- Allen, Debra. *Common Data Set 2013-2014*. Orono: University of Maine, n.d. PDF.
- Almogbel, Y.S., S.M. Abughosh, S.S. Sansgiry, F.S. Almogbel, and I.A. Alhaidar. "Predictors of Willingness to Quit Smoking among a Cohort of Male College Students in the Kingdom of Saudi Arabia." *Value in Health* 16.3 (2013): 909-14. Web. 18 Oct. 2015.
- Ansari, Walid El, Reza Oskrochi, Shokria Labeeb, and Christiane Stock. "Symptoms and Health Complaints and Their Association with Perceived Stress at University: Survey of Students at Eleven Faculties in Egypt." *Central European Journal of Public Health* 22.2 (2014): 68-79. Web. 5 Oct. 2015.
- Chiang, Yu-Chih, Susan W. Arendt, Tianshu Zheng, and Kathy A. Hanisch. "The Effects of Sleep on Academic Performance and Job Performance." *College Student Journal* 48.1 (2014): 72-87. Web. 5 Oct. 2015.
- Curtis, Susan, and Najah Shani. "The Effect of Taking Paid Employment During Term-time on Students' Academic Studies." *Journal of Further and Higher Education* 26.2 (2002): 129-38. Web. 3 Nov. 2015.
- DeBernardo, Robert L., MD, MBA, Carmen E. Aldinger, MPH, Omar R. Dawood, MPH, Robert E. Hanson, MPH, Sung-Jae Lee, MPH, and Sally R. Rinaldi, RN, MPH. "An E-Mail Assessment of Undergraduates' Attitudes Toward Smoking." *Journal of American College Health* 48.2 (1999): 61-66. Web. 11 Nov. 2015.
- Dinger, Mary K., PhD, Danielle L. Brittain, PhD, and Susan R. Hutchinson, PhD. "Associations

Between Physical Activity and Health- Related Factors in a National Sample of College Students." *Journal of American College Health* 62.1 (2014): 67-74. Web. 20 Mar. 2015.

Everett, Sherry A., PhD, MPH, Corinne G. Husten, MD, MPH, Laura Kann, PhD, Charles W.

Warren, PhD, Donald Sharp, MD, DTM & H & Linda Crossett, RDH. "Smoking Initiation and Smoking Patterns Among US College Students." *Journal of American College Health* 48.2 (1999): 55-60. Web. 11 Nov. 2015.

Geslani, Gemma P., and Claude J. Gaebelin. "Perceived Stress, Stressors, and Mental Distress Among Doctor of Pharmacy Students." *Social Behavior and Personality: An International Journal Soc Behav Personal* 41.9 (2013): 1457-468. Web. 11 Nov. 2015.

Gillen-O'Neel, Cari, Virginia W. Huynh, and Andrew J. Fuligni. "To Study or to Sleep? The

Academic Costs of Extra Studying at the Expense of Sleep." *Child Development* 84.1 (2012): 133-42. Web. 23 Sept. 2015.

Keating, Xiaofen D., PhD, Susan F. Ayers, PhD, Jingwen Liu, MS, Ke Zhou, PhD, Jianmin

Guan, PhD, Jose Castro-Pinero, PhD, and Yong Huang, B.Ed. "Physical Activity Patterns, Perceived Health, and BMI Among University Students." *American Journal of Health Studies* 28.4 (2013): 163-172. Web. 5 Oct. 2015.

Kobayashi, Futoshi. "Academic Achievement, BMI, and Fast Food Intake of American and

Japanese College Students." *Nutrition & Food Science* 39.5 (2009): 555-66. Web. 5 Oct. 2015.

Lehto, Xinran Y., Ounjoung Park, Xiaoxiao Fu, and Gyehee Lee. "Student Life Stress and

Leisure Participation." *Annals of Leisure Research* 17.2 (2014): 200-17. Web. 11 Nov. 2015.

Li, Ying, and Billie J. Lindsey. "An Association Between College Students' Health Promotion

Practices and Perceived Stress." *College Student Journal* 47.3 (2013): 437-46. Web. 11 Nov. 2015.

MacCann, C., and R. D. Roberts. "Just as Smart but Not as Successful: Obese Students Obtain

Lower School Grades but Equivalent Test Scores to Nonobese Students." *International Journal of Obesity* 37.1 (2012): 40-46. Web. 5 Oct. 2015.

- May, Ross W., and Stephen P. Casazza. "Academic Major as a Perceived Stress Indicator: Extending Stress Management Intervention." *College Student Journal* 46.2 (2012): 264-73. Web. 11 Nov. 2015.
- Parrott, Andy C. "Does Cigarette Smoking Cause Stress?" *American Psychologist* 54.10 (1999): 817-20. Web. 18 Oct. 2015.
- Perna, Laura W. *Understanding the Working College Student: New Research and Its Implications for Policy and Practice*. Sterling, VA: Stylus, 2010. Print.
- Petit, Michele L., MPH, PhD, CHES, and Kathy A. DeBarr, MS, PhD. "Perceived Stress, Energy Drink Consumption, and Academic Performance Among College Students." *Journal of American College Health* 59.5 (2011): 335-41. 5 Oct. 2015. Web.
- Pratt, Phillip A. *Common Data Set 2012-2013*. Orono: University of Maine, n.d. PDF.
- Pratt, Phillip A. *Common Data Set 2011-2012*. Orono: University of Maine, n.d. PDF.
- Pratt, Phillip A. *Common Data Set 2010-2011*. Orono: University of Maine, n.d. PDF.
- Pratt, Phillip A. *Common Data Set 2009-2010*. Orono: University of Maine, n.d. PDF.
- Pratt, Phillip A. *Common Data Set 2008-2009*. Orono: University of Maine, n.d. PDF.
- Slade, Alexander N., and Susan M. Kies. "The Relationship between Academic Performance and Recreation Use among First-year Medical Students." *Medical Education Online* 20.0 (2015): 1-8. Web. 5 Oct. 2015.
- Ramsay, Jim, PhD, and Anne Hoffmann, MS. "Smoking Cessation and Relapse Prevention Among Undergraduate Students: A Pilot Demonstration Project." *Journal of American College Health* 53.1 (2004): 11-18. Web. 11 Nov. 2015.
- VanKim, Nicole A., MPH, and Toben F. Nelson, ScD. "Vigorous Physical Activity, Mental Health, Perceived Stress, and Socializing Among College Students." *American Journal of Health Promotion* 28.1 (2013): 7-15. Web. 11 Nov. 2015.

Wald, Adrienne, EdD, MBA, RN, CHES, Peter A. Muennig, MD, MPH, Kathleen A. O'Connell,

PhD, RN, FAAN, and Carol Ewing Garber, PhD, FACSM. "Associations Between Healthy Lifestyle Behaviors and Academic Performance in U.S. Undergraduates: A Secondary Analysis of the American College Health Association's National College Health Assessment II." *American Journal of Health Promotion* 28.5 (2014): 298-305. Web. 30 June 2015.

Zajacova, Anna, Scott M. Lynch, and Thomas J. Espenshade. "Self-Efficacy, Stress, and Academic Success in College." *Research in Higher Education Res High Educ* 46.6 (2005): 677-706. Web. 5 Oct. 2015.

"University of Maine | Best College | US News." *University of Maine | Best College | US News*.

N.p., n.d. Web. 20 Feb. 2016.

Appendix A

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 114 Alumni Hall, 581-1498

PRINCIPAL INVESTIGATOR: Rachel Claussen
 EMAIL: rachel.claussen@umit.maine.edu TELEPHONE: 860-559-1033
 CO-INVESTIGATOR(S): None
 FACULTY SPONSOR (Required if PI is a student): Dr. Christopher Nightingale
 TITLE OF PROJECT: The Relationship between Physical Health and Academic Performance When Comparing Traditional Commuter and Resident Students at the University of Maine in Orono
 START DATE: July 15, 2015 PI DEPARTMENT: Honors College
 MAILING ADDRESS: 5740 Lengyel Hall-Room 115, University of Maine, Orono, Me 04468
 FUNDING AGENCY (if any): None
 STATUS OF PI:
 FACULTY/STAFF/GRADUATE/UNDERGRADUATE Undergraduate

- If PI is a student, is this research to be performed:
 - for an honors thesis/senior thesis/capstone?
 - for a master's thesis?
 - for a doctoral dissertation?
 - other (specify)
- Does this application modify a previously approved project? No (Y/N). If yes, please give assigned number (if known) of previously approved project:
- Is an expedited review requested? Yes (Y/N).

SIGNATURES: All procedures performed under the project will be conducted by individuals qualified and legally entitled to do so. No deviation from the approved protocol will be undertaken without prior approval of the IRB.

Faculty Sponsors are responsible for oversight of research conducted by their students. By signing this application page, the Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine's Policies and Procedures for the Protection of Human Subjects of Research.

7/10/15 Rachel A. Claussen
 Date Principal Investigator

Ch. Nightingale
 Faculty Sponsor

Co-Investigator

Co-Investigator

 FOR IRB USE ONLY Application # 2015-07-04 Date received 7/2/15 Review (F/E): E
 Expedited Category: _____

ACTION TAKEN:

- Judged Exempt; category 2. Modifications required? Y (Y/N) Accepted (date) 7/15/15
- Approved as submitted. Date of next review: by _____ Degree of Risk: _____
- Approved pending modifications. Date of next review: by _____ Degree of Risk: _____
- Modifications accepted (date): _____
- Not approved. (See attached statement.)
- Judged not research with human subjects

Date: 7/7/15 Chair's Signature: Cynthia A. Eidley

12/2012

Informed Consent Form

Introduction

You are invited to participate in a research project being conducted by Rachel Claussen, an undergraduate honors student at the University of Maine. My faculty advisor is Christopher Nightingale. This research attempts to determine a relationship between academic performance and physical health and whether there are any differences between traditional commuter and resident undergraduate students. In order to complete this survey you must be between the ages of 18 and 24, not be a varsity athlete, have been a full-time student during the spring semester of 2015 and never have been married.

What will you be asked to do?

You will complete a survey that will take approximately 10 minutes. The survey includes questions about your physical health and your academic performance. We also ask some demographic information (age, year in college, marital status, etc.) so that we can ensure that participants fit the guidelines for being a traditional undergraduate student.

Risks

The only risks to you will be your time and inconvenience.

Benefits

While this study will have no direct benefit to you, your participation will be contributing to the general knowledge about whether physical health has an impact on academic performance.

Confidentiality

This survey is anonymous. Your name will not be linked to the responses you provide. No one other than the primary investigator, faculty advisor and committee members will have access to the data stored on a password-protected document on a USB drive stored in a lock box. The primary investigator will delete the data no later than July 1, 2016.

Voluntary

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. Submission of the survey implies your consent to participate in this research.

Questions about the Research

If you have questions regarding this study, you may contact Rachel Claussen, rachel.claussen@umit.maine.edu. If you have questions you do not feel comfortable asking the researcher, you may contact Dr. Christopher Nightingale, faculty advisor, 115 Lengyel Hall, christopher.nightingale@umit.maine.edu.

Questions about your Rights as a Research Participant

If you have any questions about your rights as a research participant, contact Gayle Jones, Assistant to the Protection of Human Subjects Review Board at the University of Maine, 207-581-1498, gayle.jones@umit.maine.edu.

Keep this copy for your information

1. What is your gender?

- Male
- Female
- Other _____

2. What was your age for the majority of the spring semester of 2015?

- 18
- 19
- 20
- 21
- 22
- 23
- 24

3. How many semesters of college have you completed while enrolled full-time?

Please do not include summer semesters or the current semester

- 0-1
- 2-3
- 4-5
- 6-7
- 8-9
- 10 or more

4. Please write your major(s) during the spring semester of 2015:

5. What was your semester GPA for the spring semester of 2015 (not cumulative)?

- 3.5-4.0
- 2.5-3.49
- 1.5-2.49
- 0.5-1.49
- 0-0.49

6. On average, how many hours of sleep did you get on a typical night during the spring semester of 2015?

_____ hours/night

7. Did you have a job during the spring semester of 2015?

No

If yes, how many hours did you work each week: _____ hours/week

8. How would you rank the overall stress you experienced during the spring semester of 2015 on a scale of 0 to 5?

0 (no stress)

1 (little stress)

2 (some stress)

3 (moderate stress)

4 (a lot of stress)

5 (tremendous stress)

9. Where did you reside during the spring semester of 2015?

Dorm on campus

DTAV/Patch

Off campus apartment/house

Fraternity house

Other (please specify) _____

10. If you lived off campus during the spring semester of 2015, how far from campus were you?

_____ miles from campus

11. Do you participate in any sports on or off campus (intramurals, clubs, etc.)?

Please do not include division one sports

No

If yes, please indicate which ones:

12. Did you smoke cigarettes on a typical day during the spring semester of 2015?
(1 pack = 20 cigarettes)

- No
- If yes, please indicate how many: ____ cigarettes/day

13. How would you describe your general health?

- Excellent
- Good
- Okay
- Bad
- Poor

14. What was your BMI during the majority of the spring semester of 2015?

Body Mass Index (BMI)

Weight in Pounds (lbs) and Kilograms (kg)

	100 lbs 45 kg	110 lbs 50 kg	120 lbs 54 kg	130 lbs 59 kg	140 lbs 63 kg	150 lbs 68 kg	160 lbs 73 kg	170 lbs 77 kg	180 lbs 82 kg	190 lbs 86 kg	200 lbs 91 kg	210 lbs 95 kg	220 lbs 100 kg	230 lbs 104 kg	240 lbs 109 kg	250 lbs 113 kg
4'5" 1.46 m	22	25	26	29	31	34	36	38	40	43	45	47	49	52	54	56
4'9" 1.47 m	22	24	26	28	30	33	35	37	39	41	43	45	48	50	52	54
4'10" 1.49 m	21	23	25	27	29	31	34	36	38	40	42	44	46	48	50	52
4'11" 1.50 m	20	22	24	26	28	30	32	34	36	38	40	42	44	46	49	51
5'0" 1.52 m	20	22	23	25	27	29	31	33	35	37	39	41	43	45	47	49
5'1" 1.55 m	19	21	23	25	26	28	30	32	34	36	38	40	42	44	45	47
5'2" 1.57 m	18	20	22	24	26	27	29	31	33	35	37	38	40	42	44	46
5'3" 1.60 m	18	20	21	23	25	27	28	30	32	34	35	37	39	41	43	44
5'4" 1.63 m		19	21	22	24	26	28	29	31	33	34	36	38	40	41	43
5'5" 1.65 m		18	20	22	23	25	27	28	30	32	33	35	37	38	40	42
5'6" 1.67 m		18	19	21	23	24	26	27	29	31	32	34	36	37	39	40
5'7" 1.70 m			19	20	22	24	25	27	28	30	31	33	35	36	38	39
5'8" 1.73 m			18	20	21	23	24	26	27	29	30	32	34	35	37	38
5'9" 1.75 m			18	19	21	22	24	25	27	28	30	31	33	34	35	37
5'10" 1.78 m				19	20	22	23	24	26	27	29	30	32	33	35	36
5'11" 1.80 m				18	20	21	22	24	25	27	28	29	31	32	34	35
6'0" 1.83 m			16	18	19	20	22	23	24	26	27	28	30	31	33	34
6'1" 1.85 m			16		19	20	21	22	24	25	26	28	29	30	32	33

■ Healthy Weight

■ Overweight

■ Obese

BMI: _____

15. During a typical week, how many days did you exercise?

If you answer 0, please skip to the end of the survey

_____ days/week

Note: Your responses for # 17-19 should add up to the total days you gave in #16.

16. How many of these days did you do vigorous exercise for at least 20 minutes? (caused a large increase in heart rate or breathing such as running)
____ days

17. How many of these days did you do moderate exercise for at least 30 minutes? (caused a noticeable increase in heart rate such as a brisk walk)
____ days

18. How many of these days did you do low intensity exercise? (caused no noticeable increase in heart rate such as casual walking or stretching)
____ days

19. How many hours during a typical week did you exercise in the following recreation facilities on campus?

- New Balance Student Recreation Center ____ hours/week
 - Wallace Pool ____ hours/week
 - Maine Bound (bouldering and rock climbing walls) ____ hours/week
 - Bike paths ____ hours/week
 - DeMeritt Forest trails ____ hours/week
 - Bridge tennis courts ____ hours/week
 - Alford ice rink ____ hours/week
 - Sports fields or Mahaney Dome ____ hours/week
 - Other on campus facilities
-
-

· Off campus facilities

20. Do you exercise/practice sports alone or with others the majority of the time?
 Alone
 With others
 Both equally

Author's Biography

Rachel A. Claussen was born in Cincinnati, Ohio on October 7, 1994. She was raised in Connecticut and graduated from Granby Memorial High School in 2012. Rachel has a major in Kinesiology and Physical Education with a concentration in Exercise Science. She is a member of Gamma Sigma Sigma, a community service sorority.

Upon graduation, Rachel will be attending the Doctorate of Physical Therapy program at the University of New England in Portland, Maine.