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Stress and Exercise in Undergraduate Health Professions Students

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Abstract

Background: Stress is prevalent among undergraduate students, especially students in health professions majors. Exercise as a health promoting behavior decreases stress. At the same time, increased stress may decrease exercise. This study described exercise and stress among undergraduate health professions students. More specifically this study described the intensity and duration of each exercise and the frequency of exercise during a typical week of the semester for students in health professions majors.

Theoretical framework: Pender's Health Promotion Model guided this study.

Design: Cross-sectional, descriptive survey.

Methods: A convenience sample of 437 undergraduate students in a college of health professions (N =2,700) at a Midwest public university completed an electronic survey and reported stress and exercise during one typical week (a regular academic week without mid-term exams, final exams, or breaks) of the semester.

Data analysis plan: Descriptive statistics described the sample, exercise habits, and presence of stress.

Keywords: stress, exercise, undergraduate student, Health Professions

Research Question: What are the stress and exercise habits in undergraduate health professions students during one typical week of the semester?

Introduction

Stress is a subjective sensation associated with varied symptoms that result from physical and emotional pressures. Too much or too little stimulation can cause stress, resulting in damage to mind and body (Schafer, 1992), such as depression (Aselton, 2012), eating disorder symptoms (Wichianson, Bughi, Unger, Spruijt-Metz, & Nguyen-Rodriguez, 2009), and unhealthy coping behaviors such as alcohol, tobacco, and drug use (Gomathi, Ahmed, & Sreedharan, 2013). Stress can be positive or negative (Gibbons, Dempster, & Moutray, 2011). Stress can increase motivation and enhance well-being (Gibbons, Dempster, & Moutray, 2011). Human bodies respond to brief stress and return to a normal state once the stress becomes absent (Kelley, 2009). However, in today's modern society which includes balancing work, home, school, and technology, people may be constantly overwhelmed with stress and rarely get opportunities to return to normal physical states. When bodies are in states of prolonged stress, physical, psychological, or mental problems may result (Kelley, 2009).

Although college students report stress (Mahmoud, Staten, Hall, and Lennie, 2012), health professions students report increased stress compared to other college students (Roll, S., Stark, Hoekstra, Hazel, & Barton, 2012). In fact, researchers find that health professions students, such as undergraduate medical students, report high levels of stress compared to undergraduate students pursuing other degrees (Sherina & Rampal, 2004). For example, Sherina and Rampal (2004) found that stress from demanding academic environments exerts negative effects on academic performance, physical health, and psychological well-being of undergraduate medical students. While exercise is one way to manage or cope with stress (Vankim & Nelson, 2013), these students may find it challenging to fit exercise into their schedules, due to having several different demands. Balancing exercise and simultaneously

coping with stress is a problem for many health professions students. The American Association of Colleges of Nursing found that total enrollment in baccalaureate degree nursing programs is at 259,100 students (Rosseter, 2011), which only covers one type of students in the United States pursuing a degree in healthcare. In other words, there are a significant number of students pursuing careers in healthcare, meaning that it is probable that a significant number of students are experiencing increased stress.

Despite certain studies about stress in students and various coping strategies (Aselton, 2012), few researchers have described the exercise habits and stress specifically among undergraduate health professions students. Therefore, the purpose of this study is to describe stress and exercise habits in undergraduate health professions students during a typical week of the semester. Undergraduate health professions students learn the responsibility of taking care of others during college, however, it is important to realize that these students can best do this when their own health is also promoted (Barton, Hazel, Hoekstra, Roll, & Stark, 2012). Undergraduate college is the time in students' lives that they develop life-long health behavior patterns that either promote longevity or increase long-term health risks (Li & Lindsey, 2013). The investigation of how exercise and stress relate may support the need for future research about undergraduate health professions students and interventions encouraging a lifetime of health promoting behaviors to combat stress. This study proposed to answer the following question: *What are the stress and exercise habits in undergraduate health professions students during one typical week of the semester?*

Integrated Review of Literature

Many researchers have studied stress experienced by health professions students during their undergraduate education (Bryer, Cherkis, & Raman, 2013; Gomathi, Ahmed, &

Sreedharan, 2013; Roll, S., Stark, Hoekstra, Hazel, & Barton, 2012). In general, they consistently found that health professions students report increased stress compared with students pursuing other degrees (Bryer, Cherkis, & Raman, 2013; Gibbons, Dempster, & Moutray, 2011; Gomathi, Ahmed, & Sreedharan, 2013; Li & Lindsey, 2013; Roll, S., Stark, Hoekstra, Hazel, & Barton, 2012). Researchers suggest that effective stress management strategies may diminish the negative effects of stress (Aselton, 2012; Ugoji, 2012). For example, students cope with stress by a number of positive methods such as exercise and sleep, and negative methods such as substance abuse and night-time eating (Aselton, 2012; Wichianson et al., 2009; Stults-Kolehmainen & Sinha, 2013).

Levels of stress and exercise are related, with exercise being a coping strategy for stress (Roll, S., Stark, Hoekstra, Hazel, & Barton, 2012; Stults-Kolehmainen & Sinha, 2013; Ross & Thomas, 2010; Ugoji, 2012). Research from a cross-sectional study with 1,324 nursing students shows that physical activity may decrease psychological distress (Yamashita, Saito, & Takao, 2012). In another cross-sectional study of 14,804 undergraduate students, Vankim and Nelson (2013) found that those who met strenuous physical activity recommendations reported less perceived stress than those who did not meet these recommendations. In their Leisure-Time Exercise Questionnaire, Godin and Shephard (1997), categorized the intensity of exercise by the following three levels: strenuous, moderate, and light. Each level of intensity can be measured by metabolic equivalents (METs). The American College of Sports Medicine (ACSM) describes METs as, "a useful, convenient, and standardized way to describe the absolute intensity of a variety of physical activities (Pescatello, 2014, p.3)." One MET is equal to $3.5\text{mL}/\text{kg}^{-1}/\text{min}^{-1}$ resting oxygen consumption (Pescatello, 2014). In ACSM's Guidelines For Exercise Testing and

Prescription textbook, strenuous or vigorous physical activity is defined as requiring ≥ 6 METs, moderate as $3 < 6$, and light physical activity is defined as requiring < 3 METs (Pescatello, 2014).

The interventions aiming to improve the mental well-being of college students should consider promoting physical activity as an effective coping strategy (Vankim & Nelson, 2013; Walters, 2009). Fink, Black, Butt, Fenning, & Sharkey, (2014) through their research of physical therapists and physical therapy students concluded that persons within or those pursuing a degree in the health professions should embody more of the healthy behaviors that they recommend to patients, including adequate exercise, sleep, balanced diet, and managing their stress with healthy coping habits. However, health professions students, such as nursing students (Bryer, Cherkis, & Raman, 2013; Singleton, Bienemy, Hutchinson, Dellinger, & Rami, 2011), may not have the time or opportunity to perform health promoting behaviors like exercise. Although researchers have studied stress and exercise, there are a limited number that have studied intensity and frequency of exercise linked with undergraduate health professions students (See Appendix A for the Review of Literature).

Theoretical Framework

The foundation for the theoretical framework used for this study was developed by Nola J. Pender, PhD, RN, FAAN, former professor of nursing at the University of Michigan (Pender & Murdaugh, 2011). Pender generated the Health Promotion Model (HPM) to complement other models of health protection. The HPM proposes that health-promoting behaviors are affected by various influences. The HPM aims to help people pursue and achieve better health through health promoting behaviors. The HPM proposes that perceived barriers could constrain commitment to action. Positive emotions are associated with healthy behaviors; increasing the probability of commitment to that behavior while influences in the external environment can

increase or decrease commitment or participation in health-promoting behavior. The health promoting behavior or action that directly relates to our study is exercise. The influence of this health promoting behavior is stress (See Appendix B for Health Promotion Model) (Pender & Murdaugh, 2011). This study investigates how stress relates to exercise. Based on the HPM, we anticipated that increased levels of stress in students pursuing a degree in the field of health professions were associated with decreased exercise.

Methods

Design

A cross-sectional, descriptive study design was used to sample undergraduate students in a college of health professions (N =437). Participants voluntarily completed an electronic questionnaire after completing consent form (See Appendix C for Consent Form).

Undergraduate researchers developed the questionnaire in accordance with the relevant literature. Stress and exercise habits were assessed during one typical week of the semester. Prior to starting recruitment and data collection, approval from The University of Akron Institutional Review Board (IRB) was obtained.

Setting and Sample

The setting was a large, urban, public university in the Midwest US and specifically at a university College of Health Professions. The College includes around 2,700 students and is comprised of the following: Nursing, Social Work, Speech-Language Pathology and Audiology, Nutrition/Dietetics, Counseling, Sport Science and Wellness Education (athletic training, exercise science, physical education Pre-K-12, sport studies, health education) Allied Health Technology (medical assisting technology, radiologic tech, respiratory care technology, surgical technology), and student success center. The convenience sample was comprised of students in

the College of Health Professions across all grade levels and schools within the College.

Inclusion criteria include: 18 years and older, full-time undergraduate students. Exclusion criteria include: accelerated, RN/BSN, graduate, and doctoral degree students. These exclusions are due to the vast differences in demands of the programs and wanting to target a specific undergraduate population. No students were excluded based on sex, ethnicity, race, or age, as long as they were 18 years of age or older at completion of the survey.

Sampling and Data Collection Procedures

The recruitment email was sent to all students a total of three times over a 15-day period, i.e., one email every five days (See Appendix D for Recruitment Email). Informed consent was obtained at the start of the survey in a portion where each participant was required to give his or her consent electronically before continuing the survey (See Appendix C for Consent Form).

Surveys were emailed to 2,700 students during one normal week of the semester from the college office of student success (See Appendix E for Distributed survey). This ensured anonymity. No participant identifiers (name, student ID, etc.) were documented. Rather a unique identifier was assigned to each participant to protect the subject's identity. Data was collected online and with a survey including items about stress, exercise, and demographics including age in years, sex, ethnicity, marital status, hours worked per week, number of children, , major, level in education, hours spent on extracurricular activities per week, height in inches, weight in pounds, cumulative grade point average, honors student status, and year in school.

Participants completed the online survey items at their own pace, were able to review or edit previously completed items, and had the option to not respond to any items. All data was automatically entered into a dataset upon survey submission, and only co-investigators and the project sponsor had access to the data. Data was stored in password-protected computers. Once

data was imported into SPSS-23, an analysis software program, the anonymous data was analyzed.

Measures

This study was descriptive in nature for both stress and exercise within undergraduate health profession students. Exercise was measured by asking participants to report: Average weekly frequency of exercise (times per week), type of exercise (ex. running, yoga, swimming, etc.), average perceived intensity of exercise was also measured using a modified 5-point Likert scale from 0=Not Intense, 1=Almost Intense, 2=Somewhat Intense, 3=Fairly Intense to 4=Very Intense, average duration of exercise in minutes, average number of times experiencing stress throughout the week was measured using a 5-point Likert scale from 0=Never, 1=Almost Never, 2=Sometimes, 3=Fairly Often to 4=Very Often.

Demographic data included: age in years, sex, ethnicity, marital status, hours worked per week, number of children, major, level in education, hours spent on extracurricular activities per week, height in inches, weight in pounds, cumulative grade point average, honors student status, and year in school.

Data Analysis Plan

Data was automatically entered into a data file upon survey submission and then imported into a statistical analysis software program of SPSS 23. Descriptive statistics were used to report student demographics, stress, and types of exercise. Percentages were used to determine nominal and ordinal data, and means with standard deviations were used to analyze integral and ratio level data. This study aimed to answer the following research question: *What are the stress and exercise habits in undergraduate health professions students during one typical week of the semester?*

Timeline of Project Completion

This proposal and The University of Akron Institutional Review Board (IRB) application was submitted to The University of Akron Honors College by May of 2015. Data was collected in April 2015 and was automatically entered into a data file upon survey submission and then imported into a statistical analysis software program of SPSS 23. With the assistance of sponsors, data was analyzed in November 2015 and both the analysis and results sections were finalized by March 2016. The manuscript may be submitted to a peer-reviewed journal for publication. The sponsors of this study are faculty of The University of Akron in the College of Health Professions: Judith A. Juvancic-Heltzel, PhD (School of Sport Science and Wellness Education) and Carolyn Murrock, RN, PhD (School of Nursing). The readers of this project were Lisa Hart from the School of Nursing and Rachele Kappler from the School of Sport Science and Wellness Education.

Analysis

A significant portion of this study was analyzing the demographics of the College of Health Professions students. Out of the total 437 respondents 81.7% were females and the remaining 15.1% were male, however 14 participants chose not to respond to this particular survey question. Overall, 85.8% of participants were white and the second largest ethnicity was black/ African American at 5.5%. Out of all the participants 78.3% were between the ages of 18-24 and the respondents varied in their year in undergrad as follows: 14.9% were freshmen, 22.7% were sophomores, 29.5% were juniors, and 29.3% were seniors. The majority of the participants, at 55.6%, earned a grade point average of a 3.5-3.99 and then 28.6% earned a 3.0-3.49. Honors students made up 25.9% of the data sample. The majority of the respondents within the College of Health Professions were Nursing majors at 39.4%. The second most represented

major within the college was made up of 15.6% Exercise Science. The third most represented major, both Social Work and Speech Language Pathology/Audiology, each represented 10.3% of the sample (See Appendix F).

Results

When analyzing the data within the College of Health Professions students, both stress and exercise were examined closely. When examining the frequency of exercise throughout a week, 18.5% of responders exercised 2 days a week and 17.8% exercised 3 days a week. After researching the time of day the students are exercising it was found that 35.0% exercised between 4pm-8pm and 21.1% exercised between 12pm-4pm. After examining at the frequency and time frames in which the participants preferred to exercise, it was discovered that 66.8% exercised alone and 16.2% exercised with a partner. Out of all of the responders 29.1% exercised at the on campus recreation center and 19.9% exercised at their home. There were a total of 52.2% of participants who worked out between 30-60 minutes and 18.5% worked out between 61-90 minutes. When asked about how much they valued exercise 38.0% of respondents felt that exercise was very important to health and well-being. The survey results reported that the great majority of 70.7% were more than sometimes stressed throughout a normal week in the semester and 41.0% of the participants felt more stressed if they were unable to exercise.

Limitations

There were several limitations throughout the process of this research study. One significant limitation was that only 16% of the total number of College of Health Professions students participated in the survey. This did not allow for a completely accurate representation of the College as a whole. Another limitation of the study was that the participants received the

survey in an email from a sender that they may not have been familiar with. This could have deterred students from opening and participating in the survey. A final limitation of the study is that it relied on the assumption that all participants were being truthful at all times of the survey. If false, exaggerated, or under exaggerated responses were given the data could be skewed.

Conclusions

After collecting and analyzing all of the data associated with this research study, final conclusions are able to be drawn. Exercise is valued within the student population surveyed. Nearly 75% of the respondents were more than sometimes stressed. In future studies it would be effective to include a more specific survey which would allow for results that could be correlated and compared with the other college students. It would also be important to examine the relationship between stress and exercise and see how the two variables coincide within undergraduate College of Health Profession students.

As honors students this study was vital in learning the research process. Learning how to navigate the literature, efficiently reach out to the target population, and learning the difference between comparing two variables and describing them were all valuable lessons learned. In future studies, investigating the relationship between stress and exercise would be necessary for more detailed and applicable data.

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Appendix A
Review of Literature Table

	APA formatted reference[1]	Problem. Research Purpose &/or Research Question[2]	Theoretical Framework What is it and how is it used?	Design of study, Site, Population, Sampling Method. Sample Size.	Variables and measures/tools. Reliability and validity of measures/tools	Findings Conclusio ns	Implications	Limitat ions of finding s[3]
1	Aselton, P. (2012). Sources of Stress and Coping in American College Students Who Have Been Diagnosed With Depressionjca p_341 119..123. <i>Journal of Child and Adolescent Psychiatric Nursing.</i>	The study aims to explore the sources of stress in American college students who had been treated for depression and to discern their coping mechanisms .	Seidman's guide to in-depth qualitative interviews phenomenological approach using a three-part approach was used in the study	Inclusion criteria for this study were that the student had to be an undergraduate college student, between the ages of 19 and 24, in the Northeast United States, and who had taken antidepressants at some point in his/her	Depression, sources of stress	A total of 13 interviews were completed, after having 26 subjects contact the researcher to participate in the study. The sample size of 13 is consistent with the typical sample	Many college health services are seeking to address this issue by expanding counseling services and offering depression screenings on campus. Nurses working with adolescents and college-aged students can provide educational	The limitations of this qualitative study include the self reporting of previous diagnosis of depression and medication, and the use of e-mail interview

				<p>college years. Exclusion criteria included students who had started taking antidepressants within the past 4 weeks, as they may not have been able to reflect back on their experience, as well as those who have been on antidepressants for a longer period of time, and they may be in a somewhat more unstable state.</p>		<p>size identified for phenomenological investigations (Starks & Trinidad, 2007). Of the 13 students who did not complete the study, two were eliminated for having never been on antidepressants one was eliminated for having only started antidepressants within the last week,</p>	<p>interventions to help students deal with stress and the depressive symptoms it may cause. They can be advocates for children and adolescents who have difficulty fitting into traditional academic environments, and teach them the skills of self-reflection, deep breathing exercises, and other methods of relaxation therapy</p>	<p>w, in that the researcher is not able to observe the participant during the interview and read body language. There may also be an element of self-selection in that the students who responded to the survey had stronger</p>
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						<p>and the other 10 were either lost to follow-up or never returned their screening or informed consent forms. Of those who did complete the survey, five were male and eight were female. Twelve attended the large state university in the area and one attended a private female undergra</p>	<p>r feelings about the course of their depression treatment. However, the comfort level of sharing their personal details about these issues online may balance the limitation of not interviewing the students in person.</p>
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						<p>duate college. Their ages ranged from 19 to 22 years. Although the majority of the respondents were identified as White or Caucasian, one student was identified as African American, one as half Russian and half Polish, and one as Asian American. All had been</p>		
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						medicated with antidepressants for a period. The following results describe the major themes that students brought out in their interviews, followed by some sample statements in their own words.		
2	Bryer, J., Cherkis, F., & Raman, J. (2013). Health-Promotion Behaviors of Undergraduate Nursing	Nursing students are exposed to concepts of health promotion in the nursing curriculum, but do not necessarily	Pender's Health Promotion Model	Design: cross-sectional, descriptive design Site: Suburban public	Research variables: Interpersonal relations, Health responsibility, Spiritual growth, Physical	The rigorous nature of nursing programs may have a significant impact	Examining these variables may provide valuable information for the development and	Article solely examines stress levels of nursing student

	<p>Students: A Survey Analysis. <i>Nursing Education Perspectives</i>, 34(6), 410-415. doi:10.5480/11-614</p>	<p>apply them to their own lives.</p> <p>To examine health promotion behaviors and barriers to health promotion in traditional and nontraditional nursing students in an associate degree nursing program in the northeastern United States.</p>		<p>college in northeastern USA</p> <p>Population: undergrad Associate Degree nursing students</p> <p>Sampling method: Health Promoting Lifestyle Profile II</p> <p>Sample size: 143</p>	<p>activity, Stress management, Nutrition</p> <p>V&R: Cronbach's alpha</p>	<p>on health promoting behaviors and perceived barriers, particularly for nontraditional students.</p>	<p>implementation of programs that encourage student participation in a variety of health-promoting activities and help address issues related to perceived barriers to health promotion. Targeting nontraditional students may also provide the necessary support for these students to improve their overall health and foster success in their nursing programs.</p>	<p>s.</p> <p>These study results reflect one AD nursing program in a particular region of the United States. The population is too small to generalize the results to all nursing programs in this or other areas of the country.</p>
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								Replication of the study with a larger sample and in multiple geographic locations may increase the generalizability of the findings.
3	Fink, M. L., Black, B., Butt, S. L., Fenning, S. M., & Sharkey, K. M. (2014). Health Behaviors of Physical Therapists and Physical Therapist	To describe and compare the health behaviors of physical therapists and physical therapist students in south-central Pennsylvani	A total of 263 physical therapists and students participated in the study. An overwhelming majority of	Surveys inquiring about health behaviors were e-mailed to physical therapists and students affiliated	Descriptive statistics and non-parametric statistics were used to describe and compare the health behaviors of participants.	More physical therapists and physical therapist students should exemplify the healthy behaviors	In america there is disparity between health care funding and public health has been examined by researchers and health	Pilot testing of the survey for clarity of wording, test-retest reliability was

	<p>Students in South-central Pennsylvania. <i>HPA Resource</i>, 14(4), J1-J14 1p.</p>	<p>a.</p>	<p>participants (90.9%) did not exceed current weekly alcohol consumption guidelines and did not smoke (98.9%). However, smaller percentages reported getting adequate sleep (57%), eating a balanced diet (69%), managing stress effectively (81%), and engaging in recommended levels of exercise (44%).</p>	<p>with the host institution's Physical Therapy Program.</p>		<p>they recommend to patients by engaging in adequate levels of exercise, eating a balanced diet, improving sleep behaviors and managing their stress. The use of a convenience sample residing in one region of the United States limits generalizability of the findings.</p>	<p>professionals alike and the mounting evidence points to the personal behaviors of Americans as contributing to this disparity</p>	<p>not established prior to administration of the survey. Operational definitions were not provided for several of the questions in the survey. Terms such as well balanced diet and fast food, were not defined and may have</p>
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								been interpreted differently by the participants in this study This study only researched Physical Therapists and Physical Therapist Students in South-central Pennsylvania
4	Gomathi, K. G., Ahmed, S., & Sreedharan, J. (2013). Causes of stress and	This study aimed to compare causes of stress and coping		Methods: An anonymous voluntary questionnaire-based	Factors causing stress were identified using a 22-	Worries regarding the future (54.2%) and parental		In United Arab Emirates medica

	<p> coping strategies adopted by undergraduate health professions students in a university in the United Arab emirates. <i>Sultan Qaboos University Medical Journal, 13(3), 437-4</i></p>	<p> strategies adopted by a sample of undergraduate health-profession students at the Gulf Medical University, United Arab Emirates.</p>		<p> survey was conducted, from January to July 2011, among first- and second-year medicine, dentistry, pharmacy and physiotherapy students (N = 212) to identify causes of stress.</p> <p> Coping strategies were studied using the Brief COPE Inventory.</p>	<p> item questionnaire as described earlier.¹⁰</p> <p> Stressors were classified into three domains: academic-related, psychosocial and health-related.</p> <p> The Brief COPE Inventory¹¹ was administered</p> <p> to assess coping behaviors spread over 14 dimensions, including self-distraction, active coping, denial, substance use, emotional support</p>	<p> expectations (40.1%) were the major stressors. Poor diet (36.8%) and a lack of exercise (36.3%) were also reported to cause stress.</p>		<p> 1 student s</p>
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					<p>(family and friends), instrumental support (faculty and other institutional resources), behavioral disengagement (giving up coping), venting anger/ frustration, positive reframing, planning, humor, acceptance, religion and self-blame. Students were asked to rate items on a 4-point scale, ranging from 'not been doing this at all', 'doing this a little</p>			
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					bit', to 'doing this a medium amount' and 'doing this a lot'			
5	Roll, S., Stark, M., Hoekstra, T., Hazel, D., & Barton, B. (2012). Caring for self and others: Increasing health care students' healthy behaviors. <i>Work</i> , 42(3), 393-401.	<p>Problem: Shortage of health professionals due to burnout calls for recruiting more students into available health professional programs and retaining current students</p> <p>Purpose statement: The purpose of this study was to increase healthy behaviors of undergradua</p>	<p>Theoretical Framework :</p> <p>Pender's Health Promotion Model</p>	<p>Design: Experimental</p> <p>Pretest-Posttest comparison</p> <p>Site: university in Michigan</p> <p>Population: The sample consisted of 201 undergraduate health professional students from nursing, occupational therapy, and speech-language pathology</p> <p>Sampling method:</p>	<p>Independent variable and tool:</p> <p>Health promotion intervention</p> <p>V&R of tool: questionnaire & Health Promoting Lifestyle Profile II(HPLPII), a 52-item instrument that uses a 4-point Likert scale (never, sometimes, often, and routinely). Dependent variables and tool: healthy behaviors</p>	<p>The comparison group had significantly lower scores on the overall HPLPII, Physical Activity and Nutrition at Time 2 when compared to Time 1, while students who received a healthy behavior intervention increased their</p>	<p>The practice of healthy behaviors by undergraduate health professional students is important for their health and success as students, and their effectiveness as professionals. Practicing healthy behaviors also empowers professionals to teach and model healthy behaviors to their</p>	<p>Each discipline operates from a unique perspective and has curricular requirements mandated by different accrediting agencies As course content is largely dictated by</p>

		<p>te students in professional health care majors by introducing a health promotion intervention in a required course.</p> <p>Research question: In health care professionals, how does living a healthy lifestyle and managing stress help retain professionals?</p>		<p>Convenience sampling</p> <p>Sample size: 201 pupils</p>	<p>V&R of tool: content, construct, and criterion-related validity</p> <p>Cronbach's alpha</p>	<p>health responsibility while maintaining other health promoting behaviors at the end of the semester.</p>	<p>patients, as well as be more productive.</p>	<p>the accrediting agencies, incorporating a health promotion intervention was a minor part of the courses (NUR and OT). As students progress as a cohort through each professional curriculum, a randomized control</p>
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									led study was not possible and a weaker study design was implemented. In addition, the students select the discipline in which they are educated. Consequently, there could be some inherent differences
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									between students in the various disciplines besides the demographic variables examined for this study. The intervention delivered to the students needs more refinement and testing. Last, a fairly homogeneous convenience
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								sample of students from one university provided the sample for this study and limited the generalizability of the findings to other groups.
6	<p>Singleton, E. K., Bienemy, C., Hutchinson, S. W., Dellinger, A., & Rami, J. S. (2011). A Pilot Study: A Descriptive Correlational</p>	<p>The purpose of this pilot study was to determine whether a sample of junior nursing students was a healthy weight, obese or overweight, as determined by their BMI; were satisfied</p>	<p>Orem's theory of self care: describes why and how people care for themselves, and the Health Belief Model.</p>	<p>Descriptive correlational study, Southern Historically Black College and University Junior level nursing</p>	<p>Body Mass Index and Strunkard Body Image Scale.</p>	<p>Almost half of the students who provided sufficient information were overweight. Most students indicated that their body</p>	<p>This pilot study has shown that a number of students in a school of nursing can be classified as overweight or obese according to their BMI. Obesity is a serious problem for this nation. The entire SON can become the population for an action research pilot study using a design and methodology that</p>	<p>Pilot study, only looks at junior level college students, only looks at nursing</p>

	<p>Study of Factors Associated with Weight in College Nursing Students. ABNF Journal, 22(4), 89-95 7p.</p>	<p>with their body image; and whether they were interested in self care, healthy eating, and exercise. It would also determine whether there was a correlation between body mass index (BMI) and self-care, body image, self esteem, and self efficacy for physical activity and healthy eating. As defined by the CDC (^2010), BMI is a measure used to d</p>		<p>students Convenience sample Sample Size - 49</p>		<p>image reflected a larger size than they wished to be.</p>	<p>would help students to develop and implement the concepts: self care, self efficacy, self esteem, and body image. Baseline data can be collected in keeping with questions related to weight and health indices. Students would receive an eating and exercise intervention that would be carried out for three months. If the health indices improve, the SON would have the schemata for becoming a healthy community and for exploring a collaborative project with the other professional schools, like law and education. These steps could lead to making the university a healthy community.</p>	<p>students, small sample size with varying sufficient data.</p>
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7	<p>Stults-Kolehmainen, M., & Sinha, R. (2014). The Effects of Stress on Physical Activity and Exercise. <i>Sports Medicine</i>, 44(1), 81-121. doi:10.1007/s40279-013-0090-5</p>	<p>Investigating the influence of stress on indicators of PA and exercise.</p>		<p>Systematic review of literature</p> <p>A systematic search of Web of Science, PubMed, and SPORTDiscus was employed to find all relevant studies</p>	<p>Stress exercise</p> <p>A rating scale (0-9) modified for this study was utilized to assess the quality of all studies with multiple time points</p>	<p>The literature search found 168 studies that examined the influence of stress on PA. Studies varied widely in their theoretical orientation and included perceived stress, distress, life events, job strain, role strain, and work-</p>	<p>Overall, the majority of the literature finds that the experience of stress impairs efforts to be physically active. Future work should center on the development of a theory explaining the mechanisms underlying the multifarious influences of stress on PA behaviors.</p>	

						<p>family conflict but not lifetime cumulative adversity.</p> <p>some individuals utilize exercise to cope with stress. Several other factors may moderate stress and PA relationships, such as stages of change for exercise. Habitually active individuals exercise more in the face of stress,</p>		
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						and those in beginning stages exercise less.		
8	Ugoji, N. (2012). Perceived Emotional Intelligence and Stress Management among Undergraduate Students. <i>IFE Psychologia</i> , 20(2), 102-106.	The study investigated perceived emotional intelligence and stress management among 350 undergraduate university students		Design: descriptive survey research design Site: Nigeria Population: 350 sampling method: randomly selected	The Pearson correlation was used to investigate the relationship between the variables and t-test of significance was used to determine the difference in stress management among high and low emotional intelligent students.	It was found that perceived emotional intelligence and stress management were related and high emotional intelligent students were better in stress management. Based on this, it was recommended that the inclusion		

						of emotional intelligence training in the school curricula could be considered as important to enable students improve their awareness and assertively express themselves particularly in the management of stress.		
9	Walters, Laura Brooke, "A Descriptive Study of the Diet and	The purpose of this study is to evaluate the dietary habits, physical	It has been reported that 40% to 50% of college students are physically	Design. A Descriptive Study of the Diet and Physical	A total of 11 students began the program at baseline. The sample was comprised of male and	The results suggest that the majority of participants have experience		The primary limitation of this study

	<p>Physical Activity Practices of Overweight and Obese College Students Enrolled in a Weight Loss Program” (2009). University of Kentucky Master's Theses. Paper 633.</p>	<p>activity, and demographic characteristics of college students entering a university-sponsored weight loss program.</p>	<p>inactive (Keating, Guan, Pinero, & Bridges, 2005). Multiple interactions exist between lack of physical activity and obesity (Rippe & Hess, 1998). Physical activity is essential to achieve proper energy balance in order to prevent or reverse obesity (Rippe & Hess, 1998). Factors related to decreased physical activity</p>	<p>Activity Practices of Overweight and Obese College Students Enrolled in a Weight Loss Program Setting. This is a study of college students at the University of Kentucky who volunteered to participate in Wildcat Fit Camp, a weight loss program conducted on campus. Wildcat</p>	<p>female students. Participants were asked to fill out the Center for Epidemiologic Studies Depression Scale (CES-D) at the time of the introductory meeting. The CES-D assessed how participants felt in the past week to help determine if they experience any amount of depression (Wadden & Stunkard, 1985). Participants were also given a packet of several other questionnaires that were to be completed and returned</p>	<p>d weight gain in the past year. The dietary consumption patterns of this small sample population tended to include less than the recommended amounts of calories, fiber, calcium, vitamin A, fruits, and vegetables. Diets tended to include more than the recommended amounts of protein, carbohydrate, and sodium. The</p>		<p>was the small sample size due low interest and lack of commitment</p>
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			<p>include: negative experiences using campus recreation facilities, poor weather, lack of time/time management, motivation, increased time spent studying, and lack of social support for exercise</p>	<p>Fit Camp was conducted in the Department of Nutrition and Food Science (NFS) in conjunction with University Health Services. All procedures were approved by the University of Kentucky Institutional Review Board (IRB). Baseline assessments were performed in the NFS assessment lab.</p>	<p>at the baseline assessment. The WHI Physical Activity Questionnaire assessed amounts and types of physical activity (Meyer A, Evenson K, Morimoto L, Siscovick D, & White E, 2009). The weight efficacy lifestyle questionnaire (WEL-Q) assessed participant's confidence levels in their ability to utilize self-control in different situations involving food and eating</p>	<p>results of the study suggest that students living on campus tend to participate in significantly greater amounts of strenuous physical activity than students living off campus. It is recommended that future studies of college students participating in weight loss programs include a larger, more diverse sample</p>		
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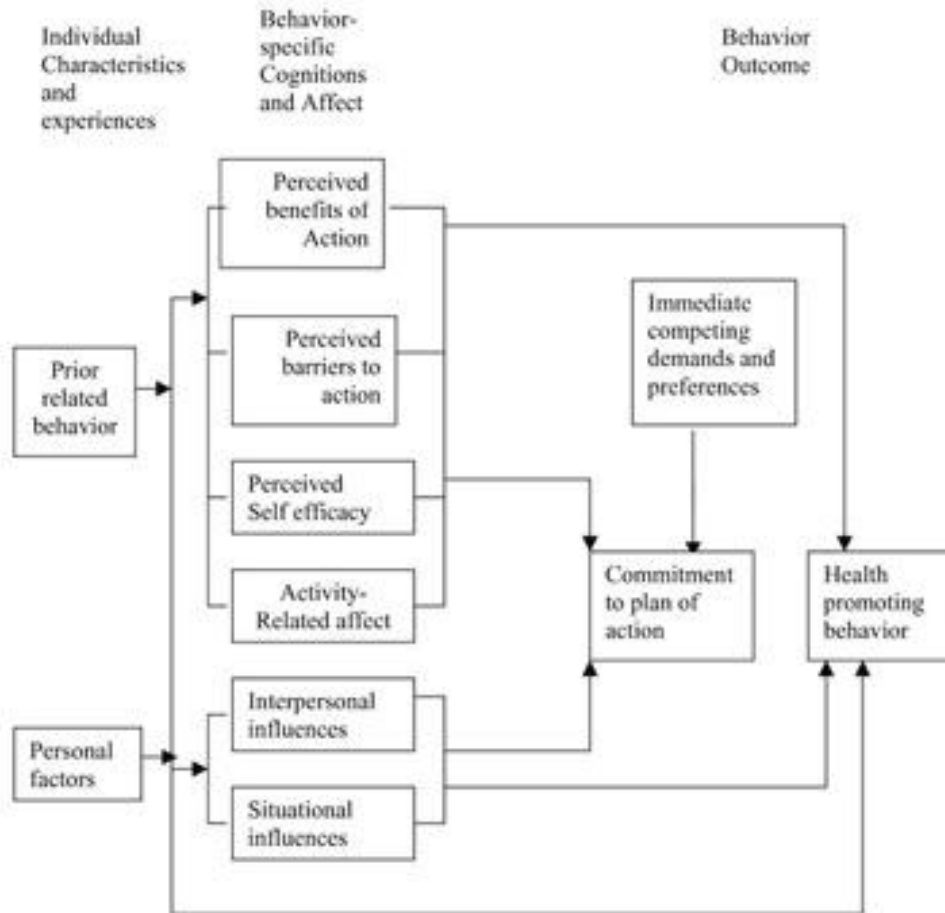
						size in order to obtain more accurate conclusions.		
10	<p>Wichianson, J., Bughi, S., Unger, J., Spruijt-Metz, D., & Nguyen-Rodriguez, S. (2009). Perceived stress, coping and night-eating in college students. <i>Stress & Health: Journal Of The International Society For The Investigation Of Stress</i>, 25(3), 235-240.</p>	<p>Problem: 60% or more college students reported have high or very high levels of stress</p> <p>Purpose statement: The present study investigated the role of coping in the relationship between perceived stress and night-eating syndrome (NES) in college</p>	<p>The night-eating syndrome (NES) was first described by Stunkard, Grace and Wolff (1955) as an eating pattern marked by morning anorexia and evening hyperphagia. Research on the prevalence of NES in college populations has been limited.</p>	<p>Design: Cross-sectional</p> <p>Site: private university in southern California</p> <p>Population: undergraduates ages 18-29 years</p> <p>Sampling method: Convenience sample</p> <p>Sample size: 95</p>	<p>Independent variable and tool: perceived stress</p> <p>V&R of tool:</p> <p>Dependent variables and tool: coping and night-eating</p> <p>V&R of tool:</p>	<p>This study has shown that college students who experience stress may engage in night-eating as a result of utilization of maladaptive coping strategies. Furthermore, students who tend to use adaptive</p>	<p>Stress is indeed part of the college experience and the inability to properly cope with these stressors has the potential to lead to problem eating behaviors, which in turn, can lead to weight gain. This study has shown that college students who experience stress may engage in</p>	<p>First, the use of convenience sampling methods limits representation of the sample population. While the ethnic breakdown of the sample population did match that of the</p>

		<p>students.</p> <p>Research question: In college students, what is the role of coping in the relationship between perceived stress and night-eating syndrome?</p>	<p>Interestingly, the transition into college life has been associated with weight gain</p>			<p>coping strategies less often are likely to engage in night-eating in the face of perceived stress. Through these findings, intervention programming efforts may be made possible to help students cope with college stress, and address issues of problem eating behaviors, especially NES.</p>	<p>night-eating as a result of utilization of maladaptive coping strategies. Furthermore, students who tend to use adaptive coping strategies less often are likely to engage in night-eating in the face of perceived stress. Through these findings, intervention programming efforts may be made possible to help students cope with college stress, and address issues of problem</p>	<p>undergraduate student body, the ratio of female to male subjects comprising the sample population was greater than that of the actual student body. The second limitation of the present study is sample size. The modest sample size</p>
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						Doing so may also address issues of possible weight gain in the college population.	eating behaviors, especially NES.	used in the present study disallows various assessments, including mediated moderation and moderated mediation.
1 1	Yamashita, K., Saito, M., & Takao, T. (2012). Stress and coping styles in Japanese nursing students. <i>International Journal Of Nursing Practice</i> , 18(5), 489-	Objective of investigation was to examine the stress and coping styles in Japanese nursing students		population: seven nursing schools 1428 total students In a cross-sectional analysis, 1324 students completed the anonymous	The principal measures of the stress and coping styles were the General Health Questionnaire (GHQ)-12 and Brief Coping Orientations to Problems Experienced scale	The percentage of nursing students who reported regular exercise was 38.5% The three most common		Study of Japanese students

	496. doi:10.1111/j.1 440- 172X.2012.02 056.x			self- administere d questionnai res		coping styles adopted by the nursing students were acceptanc e, self- distractio n and using instrume ntal support.		
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Appendix B
Health Promotion Model by Dr. Nola Pender (1982)



Appendix C Consent Form

Title of Study: The Relationship Between Stress and Exercise in Undergraduate Health Professions Students

Introduction: You are invited to participate in an inter-professional honors research project entitled “The Relationship Between Stress and Exercise in Undergraduate Health Professions Students.” This study is by Meghan Brickner, Leah Rosler, and Kristin Weismantel, senior students within the College of Health Professions at The University of Akron.

Purpose: The purpose this study is to stress and exercise in undergraduate health professions students during a typical week of the semester. **Procedures:** If you volunteer to participate in this study, you were asked to complete a short, online survey about both stress and exercise throughout a typical week in the semester. It will take less than 10 minutes to complete the survey. Additionally, you were asked to give some information about your age, sex, level of education, ethnicity, marital status, sexual history, major, and possession of health insurance. You will not be asked to give any identifying information at any time.

You are eligible to participate in the study if you are enrolled in traditional undergraduate health professions programs and at least 18 years old. Traditional undergraduate health professions include the following: nursing, social work, speech-language pathology and audiology, nutrition/dietetics, counseling, sport science and wellness education (athletic training, exercise science, physical education Pre-K-12, sport studies) allied health technology (medical assisting technology, radiologic tech, respiratory care technology, surgical tech), student success center. You are not eligible if you are an accelerated or graduate health professions programs. No persons were excluded based on sex, ethnicity, race, sexual orientation, marital status, or age as long as they are 18 years or older.

Benefits and Risks: You will receive no direct benefit from your participation in this study, but your participation may help us better understand the relationship between stress and exercise among undergraduate health professions students. There are some possible risks involved in completing the survey because you are asked to answer questions about personal information. And although we hope you respond to every item on the survey, whether or not you do is up to you! Because no identifying information is collected in the survey and because survey distribution and submission occur anonymously and online, there is very minimal risk of participant identification. You will complete the survey at your leisure and in a comfortable, secure, and private environment. In case you feel the need to talk with a counselors and health care provider after completing this survey, please contact: (1) The Counseling Center, Simmons Hall 306, Phone: 330-972-7082, Website: <http://www.uakron.edu/counseling/> and/or (2) Student Health Services, Student Recreation and Wellness Center, Suite 260, Phone: 330-972-7808 Website: <http://www.uakron.edu/healthservices/>

Right to refuse or withdraw: Participation is voluntary. Refusal to participate or withdraw from the study at any time will involve no penalty. Failure to participate in no way affects your academic standing.

Anonymous and Confidential Data Collection: No identifying information were collected, and your anonymity is further protected by not asking you to sign and return the informed consent form.

Confidentiality of Records: Data are collected with an online survey. The survey is loaded into Qualtrics, an electronic survey software program. You will complete the survey electronically and at your own convenience. Electronic survey completion means that data are automatically entered into a data set. Disconnecting participants from their surveys is also related to protection of human participants.

Who to Contact with Questions: If you have any questions about this study, you may contact Kristin Weismantel (krw43@zips.uakron.edu), Leah Rosler (lnr17@zips.uakron.edu), Meghan Brickner (mgb28@zips.uakron.edu), Judith A. Juvancic-Heltzel, PhD (Advisor) at jaj52@uakron.edu or Carolyn Murrock, PhD (Advisor) at cjm4@uakron.edu. This project has been reviewed and approved by The University of Akron Institutional Review Board. If you have any questions about your rights as a research participant, you may call the IRB at (330) 972-7666.

Acceptance & Signature: I have read the information and voluntarily agree to participate in this study. My completion and submission of this survey will serve as my consent. I may print a copy of this consent statement for future reference.

Appendix D
Recruitment Email

Hello, College of Health Professions Students!

You are invited to participate in one of the *first* inter-professional honors research projects at The University of Akron entitled “The Relationship Between Stress and Exercise in Undergraduate Health Professions Students.” This study is by Meghan Brickner, Leah Rosler, and Kristin Weismantel, senior students within the College of Health Professions at The University of Akron. If you choose to participate, you will take an online survey which should take less than 10 minutes to complete. All data are collected anonymously, as described on this link: [Click here to go to the survey!!](#)

To those of you who have already participated, thank you! This study could not be done with you.

To those of you yet to participate, please do and thank you in advance for your participation and dedication to the advancement of nursing knowledge! Your time is greatly appreciated!

Sincerely,
Meghan Brickner, Leah Rosler, and Kristin Weismantel

Appendix E
Qualtrics Distributed survey

Q1 What is your sex?

- Male (1)
- Female (2)
- Other (0)

Q2 Please specify your ethnicity.

- White (1)
- Hispanic/ Latino (2)
- Black/ African American (3)
- Native American/ American Indian (4)
- Asian/ Pacific Islander (5)
- Other (6)

Q3 What is your age in years?

- 12-17 (1)
- 18-24 (2)
- 25-34 (3)
- 35-44 (4)
- 45-54 (5)
- 55-64 (6)

Q4 What is your marital status?

- Single, never married (1)
- Married or domestic partnership (2)
- Widowed (3)
- Divorced (4)
- Separated (5)

Q5 How many children do you have?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5+ (5)

Q6 What year are you in your undergraduate career?

- Freshman (1)
- Sophomore (2)
- Junior (3)
- Senior (4)

Q7 What is your cumulative GPA?

- 4.0 (1)
- 3.5-3.99 (2)
- 3.0-3.49 (3)
- 2.5-2.99 (4)
- 2.0-2.49 (5)
- 1.5-1.99 (6)
- Less than 1.5 (7)

Q8 Are you a student in the Honors College?

- Yes (1)
- No (2)

Q9 What is your major?

- Athletic Training (1)
- Child Life Specialist (2)
- Community Services Technology (3)
- Exercise Science (4)
- Medical Assisting Technology (5)
- Nursing (6)
- Nutrition/ Dietetics (7)
- Physical Education (8)
- Radiologic Technology (9)
- Respiratory Therapy (10)
- Social Work (11)
- Speech-Language Pathology and Audiology (12)
- Sports Studies (13)
- Other (14)

Q10 Do you have any secondary majors or minors?

- Yes (1)
- No (2)

Q11 How many hours do you work during a typical week?

- Do not work (1)
- 0-5 (2)
- 6-10 (3)
- 11-15 (4)
- 16-20 (5)
- 21-25 (6)
- 26-30 (7)
- 31-35 (8)
- 36-40 (9)
- 40+ (10)

Q12 How many hours per week do you typically spend on extracurricular activities?

- None (1)
- 0-5 (2)
- 6-10 (3)
- 11-15 (4)
- 16-20 (5)
- 21-25 (6)
- 26-30 (7)
- 31-35 (8)
- 36-40 (9)
- 40+ (10)

Q13 How much do you weigh in pounds?

Q14 What is your height in inches?

Q15 Do you follow a regular routine of physical exercise?

- Yes (1)
- No (2)

Q16 How many days do you typically exercise in a week?

- 0 (0)
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)

Q17 What time of day do you typically exercise?

- Before 8am (1)
- 8am-12pm (2)
- 12pm-4pm (3)
- 4pm-8pm (4)
- 8pm-12am (5)

Q18 In what setting do you typically exercise?

- Individually (1)
- With a Partner (2)
- With a Personal Trainer (3)
- Group Exercise Classes (4)
- Intramural, Club, or Team Sports (5)

Q19 What type of exercise do you typically do? Select all that apply.

- Endurance/ Aerobic (i.e. brisk walking or jogging, yard work, dancing etc) (1)
- Strength/ Resistance (i.e. lifting weights, resistance band exercises, body weight exercises etc) (2)
- Balance (i.e. Tai Chi etc) (3)
- Flexibility (i.e. Yoga etc) (4)

Q20 Where do you typically exercise?

- Student Recreation and Wellness Center (REC) (1)
- Outside (2)
- In your room/ home (3)
- Apartment Gym (4)
- Membership Gym (5)
- Other (6)

Q21 How long is your typical exercise session?

- 30 minutes or less (1)
- 30-60 minutes (2)
- 61-90 minutes (3)
- 91-120 minutes (4)
- 121+ minutes (5)

Q22 How intense is your typical exercise session? 0=Not Intense, 1= Almost Intense, 2=Somewhat Intense, 3=Fairly Intense, 4=Very Intense

_____ Click to write Choice 1 (1)

Q23 How important is exercise to you? 0=Not Important, 1= Almost Important, 2=Somewhat Important, 3=Fairly Important, 4=Very Important

_____ Click to write Choice 1 (1)

Q24 How often do you feel stressed during a typical week throughout the semester? 0=Never Stressed, 1= Almost Never Stressed, 2=Sometimes Stressed, 3=Fairly Often Stressed, 4=Very Often Stressed

_____ Click to write Choice 1 (1)

Q25 Do you feel stressed when you can not exercise?

- Yes (1)
- No (2)
- Sometimes (3)

Q26 Do you feel stressed when you do exercise?

- Yes (1)
- No (2)
- Sometimes (3)

Q27 What do you do when you feel stressed? Select all that apply.

- Sleep (1)
- Exercise (2)
- Drink Alcohol (3)
- Use Drugs (4)
- Eat (5)
- Not Eat (6)
- Meditate/ Deep Breathing (7)
- Writing/ Journaling/ Reading (8)
- Shop (9)
- Other (10)

Q28 Does your diet improve when you are exercising regularly?

- Yes (1)
- No (2)
- Stays the same (3)

Q29 Would you consider your diet to be well-balanced and/ or healthy?

- Yes (1)
- No (2)
- Most of the time (3)

Appendix F
Demographic Charts

Sex		Frequency	Percent
Valid	Male	66	15.1
	Female	357	81.7
	Total	423	96.8
Missing	System	14	3.2
Total		437	100.0

