



Western Michigan University  
ScholarWorks at WMU

---

Honors Theses

Lee Honors College

---

4-9-2013

## Physical Activity in Health Profession Students

Sara Haller

Western Michigan University, [sara.c.haller@gmail.com](mailto:sara.c.haller@gmail.com)

Follow this and additional works at: [https://scholarworks.wmich.edu/honors\\_theses](https://scholarworks.wmich.edu/honors_theses)



Part of the Other Nursing Commons

---

### Recommended Citation

Haller, Sara, "Physical Activity in Health Profession Students" (2013). *Honors Theses*. 2245.  
[https://scholarworks.wmich.edu/honors\\_theses/2245](https://scholarworks.wmich.edu/honors_theses/2245)

This Honors Thesis-Open Access is brought to you for free and open access by the Lee Honors College at ScholarWorks at WMU. It has been accepted for inclusion in Honors Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact [wmu-scholarworks@wmich.edu](mailto:wmu-scholarworks@wmich.edu).



Physical Activity in Health Professions Students

Andrea Mahon and Sara Haller

Lee Honors College Thesis

Western Michigan University

## Physical Activity in Health Professions Students

**Abstract**

Physical inactivity is a major issue for college-aged students. The purpose of this study is to explore the use of text messages as an intervention to increase physical activity in students who attend classes at the College of Health and Human Services. Physical activity is bodily movement that requires the expenditure of energy (Centers for Disease Control and Prevention, 2011a). A quasi-experimental study using a convenience sample was conducted in order to answer the research question. Students (n=134) were recruited from the College of Health and Human Services and were asked to fill out a demographics questionnaire and sign an informed consent. Text messages were sent to all participants at 9 PM reminding them to send in their number of steps. Additional motivational text messages were sent to those in the intervention group at 4 PM starting on day three of the study. After the two week study, the data was analyzed, and it was found that there was no significant difference in the number of steps at the beginning of the study and the end of the study for either group. Using a study that was longer in length with more accurate pedometers may yield better results for future studies.

Physical inactivity is becoming a growing problem in today's society. Many people do not meet the daily requirements of physical activity and exercise. The World Health Organization (2012) recommends 150 minutes per week of moderate intensity aerobic activity such as brisk walking, housework, or dancing or 75 minutes per week of vigorous intensity activity such as running, competitive sports, or fast cycling. Achieving the recommended daily and weekly requirements for physical activity is important for unhealthy and healthy individuals. Regular physical activity, defined by WHO as bodily movement that requires energy expenditure

demands. Therefore, the purpose of this study was to explore an intervention to increase physical activity in students who attend classes at the College of Health and Human Services.

## **Review of Literature**

### **Health of College Students**

Interventions to increase physical activities have been tested in numerous age groups. Boyle, Mattern, Lassiter, and Ritzler (2011) designed a college class that allowed enrolled students to pick a health behavior that the students wanted to work on and change during the semester. The students were allowed to choose whether or not they wanted a peer mentor to help them reach this goal. The researchers found that female students, both those who were active and inactive and who chose to receive help from a peer mentor, improved physical activity levels (Boyle et al, 2011).

There is recent research about using the internet as an intervention to correct unwanted health behaviors. LaChausse (2012) designed a research study comparing an online based program titled “My Student Body” or enrolling in a traditional course at a university; both of these groups received college credits. The two intervention groups, previously listed, were compared to a comparison group, who did not enroll in “My Student Body” or a traditional course at the university. The intervention courses involved education regarding fruit and vegetable consumption and benefits, exercise information, stress and BMI. The results showed the internet based intervention helped participants increase fruit and vegetable consumption and lowered stress but had no effect on attitudes toward exercise or effect the amount of exercise in which the participants engaged. It was also noted that the traditional in-class college course did

2010). Another group received text messages that reflected instrumental beliefs of exercise, such as exercise helping to keep one's heart healthy. The third experimental group had alternate instrumental and affective text messages (Sirriyeh et al, 2010). The researchers found that while all of the groups increased their physical activity levels, those who were in the affective group had the most significant increase in their physical activity levels. While more research needs to be done on this subject, it seems that cellular devices hold promise and may help especially younger, more tech-savvy people to increase their levels of physical activity.

Cell phone use and other devices are widely used by teens and young adults. Groups of people including less educated young adults, people who engage in risky health behavior, have a higher body mass index or who change primary resident locations have a high user rate for mobile devices (Fjeldsoe, Marshall, & Miller, 2009). The use of mobile devices and text messaging as an intervention may be an effective means to reach busy, mobile, young adults. Fjeldsoe et al. (2009) found that most studies performed with text messaging as an intervention were for clinical care to ill patients. They also found that fewer studies focused on using text message interventions for health promotion. Mobile devices and text messages can reach large numbers of people who may not be ill and are not regularly seeing a health professional which aids in their ability to serve as a health promotion tool. Text messages that were tailored to the recipient/participant in ways such as using names, participant personal goals, gender, and personal circumstances were well received and the participants had a low attrition rate. On the other hand, studies that used generalized mass text messages that were not tailored to the unique participants were associated with higher attrition rates. Fjeldsoe et. al (2009), suggested further research aimed at the tailoring of text messages in order to better understand what a text message should or should not include in order to have studies with low attrition rates. Newton, Wiltshire



exercise found in the study by Burke and McCarthy (2010) were: that it was tiring, hard work, fatiguing, time-consuming, and places to exercise were too far away. Students also reported several perceived benefits associated with physical activity which included: increased fitness levels, improved body image, improved functioning of the cardiovascular system, sense of personal accomplishment, and increased muscle strength.

### **Theoretical Framework**

The framework for this study and the included interventions was based upon Nola Pender's Health Promotion Model. The Health Promotion Model is a theoretical framework that is useful for people in all developmental stages and varying degrees of health. The model focuses primarily on three areas: individual characteristics and experiences, behavior-specific knowledge and affect, and behavioral outcomes. Behavior-specific knowledge and affect contain several variables, such as perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences. These variables have motivational significance for the wellness-seeking individual and can be modified through various nursing actions (Potter & Perry, 2009).

In conclusion, there are many variables that can lead to weight gain and physical inactivity. College students, in particular, are at risk due to rigorous schedules and unhealthy eating and sleep patterns. Many researchers have designed interventions to increase physical activity in this population. Interventions, such as text messaging and pedometers, have been shown to be effective to increase physical activity in some studies. The most effective text messages were short, positive, and relevant. The Health Promotion Model provides the best

asked to text in the number of steps completed that day. Later, the student researchers recorded the steps for each day on a spreadsheet.

Starting on the third day of the study, those in the intervention group received affective messages encouraging them to increase their steps for that day. They received this text at 4PM. This time was chosen to reduce contamination with the control group, as most students would be finished with classes and clinical practices where they might be with other students in the control group. This time was early enough so that they might have time to exercise or participate in an activity to increase their steps. The script for the text messages was adapted from the study by Sirriyeh et al. (2010) and is listed in Appendix C.

### **Sample**

A sample of 134 students was recruited from the College of Health and Human Services. This college was chosen because of the focus on health in their professional studies, as well as for the convenience of the student researchers who are nursing students. This sample size was determined after examining the study by Sirriyah et al. (2010) and considering budget. First, the Sirriyah et al. study had 120 subjects in four groups and had sufficient power to determine differences between groups using the same intervention. Grant funding provided by Lee Honors College allowed for the purchase of 150 pedometers.

To be included in the sample, a student had to be enrolled in at least one course at CHHS; be able to read, write, and understand English; have a cell phone with texting capability and be willing to receive up to two texts per day for 14 days, and willing to send at least one text per day to report the number of steps for that day. Possible participants were excluded if they had faculty or staff status or had a known physical disability that limited mobility, as steps were measured

### Data Analysis

Data were entered into SPSS 20 and cleaned. Appropriate parametric and non-parametric statistics were computed to answer the research question. An alpha of 0.05 was set *a priori*. The mean number of steps reported by participants for the first two days of the study before the intervention started (Time 1) was calculated for all participants. The mean number of steps reported by participants for the 12 days after the text messages were sent (Time 2) was also calculated. There was no significant difference between the Time 1 and Time 2 steps for all participants (paired  $t = 0.216$ ,  $df = 111$ ,  $p = ns$ ). When the Time 1 and Time 2 steps for the control group and the intervention group were calculated separately, neither group had a statistically significant change in steps (control paired  $t = 0.013$ ,  $df = 53$ ,  $p = ns$ ; intervention paired  $t = 0.237$ ,  $df = 57$ ,  $p = ns$ ).

### Results

Before the data was analyzed to answer the research question, the treatment and control groups were compared to determine whether they were statistically different before starting the intervention. There were no statistically significant differences between the groups when the study started. During the study, 22 participants did not provide enough data for the 14 days of the study that could be used in the data analysis. This left 112 participants that provided data used to answer the research question. The number of steps was paired at the beginning of the study with steps the individuals in the sample provided throughout the study. There was no statistically significant increase in steps in either group. Both groups took similar numbers of steps at the beginning of the study and throughout the study. On day eight of the study, the treatment group had an increase in steps. However, it was not statistically significant. See Appendix E for graphical representation.



pedometer-related issues, pedometers should be carefully tested to ensure precision and accuracy. Although the findings did not show statistical significance, further research with a longer study and higher quality pedometers may lead to significant research findings. During recruitment, it was found that people were enthusiastic and excited to be a part of this study. Health professionals work in a stressful environment. Learning healthy behaviors as students might improve their health, productivity and effectiveness as future health care professionals.

- Jackson, E.M., & Howton, A. (2008). Increasing walking in college students using a pedometer intervention: Differences according to body mass index. *Journal of American College Health, 57*(2), 159-164.
- LaChausse, R.G. (2012). My student body: Effects of an internet-based prevention program to decrease obesity among college students. *Journal of American College Health, 60*(4), 324-330. Doi:10.1080/07448481.2011.623333
- LeCheminant, J. D., Smith, J. D., Covington, N. K., Hartdin-Renschen, T., & Heden, T. (2011). Pedometer use in university freshmen: A randomized controlled pilot study. *American Journal of Health Behavior, 35*(6), 777-784.
- Mestek, M. L., Plaisance, E., & Grandjean, P. (2008). The relationship between pedometer-determined and self-reported physical activity and body composition variables in college-aged men and women. *Journal of American College Health, 57*(1), 39-44.
- Militello, L. K., Kelly, S. A., & Melnyk, B. (2012). Systematic review of text messaging interventions to promote healthy behaviors in pediatric and adolescent populations: Implications for clinical practice and research. *Worldviews on Evidence-Based Nursing, 9*(2), 66-77.
- Morgenthaler, T. (2010). Adult health. Retrieved August 21, 2012, from <http://www.mayoclinic.com/health/how-many-hours-of-sleep-are-enough/AN01487>
- Newton, K., Wiltshire, E., & Elley, C. (2009). Pedometers and text messaging to increase physical activity: Randomized controlled trial of adolescents with type 1 diabetes. *Diabetes Care, 32*(5), 813-815. doi:10.2337/dc08-1974
- Potter, P., & Perry, A. (2009). *Fundamentals of nursing*. (7th ed.). St. Louis, Missouri: Mosby Elsevier.

Appendix A  
Informed Consent

WESTERN MICHIGAN UNIVERSITY



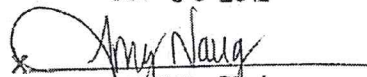
WMU Bronson School of Nursing  
College of Health and Human Services

WESTERN MICHIGAN UNIVERSITY

H. S. I. R. B.

Approved for use for one year from this date:

OCT 08 2012

  
HSIRB Chair

**Study Title:** Physical Activity in Health Profession Students  
**Principal Investigator:** Mary Ann Stark, PhD, RNC  
Debra Lindstrom, PhD, OTRL  
**Student Researchers:** Sara Haller, nursing student  
Andrea Mahon, nursing student  
Kelly Elrod, BSN, RN, graduate student  
Jessica Bell, research assistant

You have been invited to participate in a research project titled "Physical Activity in Health Profession Students." This project will serve as Sara Haller & Andrea Mahon's Lee Honors College thesis. This consent document will explain the purpose of this research project and will go over all of the time commitments, the procedures used in the study, and the risks and benefits of participating in this research project. Please read this consent form carefully and completely and please ask any questions if you need more clarification.

**What are we trying to find out in this study?**

Physical activity is important for staying healthy. In this study, we are testing to see whether messages sent via a cell phone help to increase physical activity.

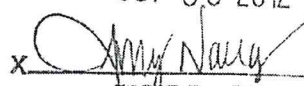
**Who can participate in this study?**

You have been asked to participate in this study because you are a health professions student at Western Michigan University. To participate in the study you must be a student enrolled in at least one course at CHHS. You must be able to read, write, and understand English. You also must have a cell phone with texting capability and be willing to receive up to 2 texts per day for 14 days, and willing to send at least one text per day. If you are unable to read, write or understand English and are not a student at CHHS (are faculty or staff status) you may not enroll in this study. If you have a known physical disability that limits your mobility, you will not be able to participate as steps will be measured for the study.

**Where will this study take place?**

The study takes place here at WMU.

**What is the time commitment for participating in this study?**

WESTERN MICHIGAN UNIVERSITY  
H. S. I. R. B.  
Approved for use for one year from this date:  
OCT 08 2012  
x   
HSIRB Chair

agree to be in this study, no identifying information about you will be given out. Only the data from the entire group will be presented or included in a thesis.

**What if you want to stop participating in this study?**

You can choose to stop participating in the study at anytime for any reason. You will not suffer any prejudice or penalty by your decision to stop your participation. You will experience NO consequences either academically or personally if you choose to withdraw from this study.

The investigator can also decide to stop your participation in the study without your consent.] If you have any questions about this, please contact Dr. Mary Ann Stark at 269-387-8234 or by email at mary.stark@wmich.edu or Dr. Debra Lindstrom at 269-387-7239 or by email at debra.lindstrom@wmich.edu. You can also contact Sara Haller at 248-675-5738, Andrea Mahon at 810-623-5268, or Kelly Elrod at 269-599-2439. If you have any concerns about the research study, you also can contact the Chair of the Human Subjects Institutional Review Board at WMU at 387-8293 or the Vice President for Research at WMU at 387-8298.

This consent document has been approved for use for one year by the Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

-----

I have read this informed consent document. The risks and benefits have been explained to me. I agree to take part in this study.

Please Print Your Name

\_\_\_\_\_  
Participant's signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant signature

\_\_\_\_\_  
Researcher signature



8. In the last month, how often have you felt that you were on top of things?.....0 1 2 3 4

9. In the last month, how often have you been angered because of things that were outside of your control? ..... 0 1 2 3 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?..... 0 1 2 3 4

What is your cell phone number?

---

#### INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

---

1. During the past month, what time have you usually gone to bed at night?

BED TIME \_\_\_\_\_

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

NUMBER OF MINUTES \_\_\_\_\_

3. During the past month, what time have you usually gotten up in the morning?

GETTING UP TIME \_\_\_\_\_

4. During the past month, how many hours of actual sleep did you get at night? (this may be different than the number of hours you spent in bed.)

HOURS OF SLEEP PER NIGHT \_\_\_\_\_

past month \_\_\_\_\_ once a week \_\_\_\_\_ a week \_\_\_\_\_ times a week \_\_\_\_\_

g) Feel too hot

Not during the      Less than      Once or twice      Three or more  
past month \_\_\_\_\_ once a week \_\_\_\_\_ a week \_\_\_\_\_ times a week \_\_\_\_\_

h) Had bad dreams

Not during the      Less than      Once or twice      Three or more  
past month \_\_\_\_\_ once a week \_\_\_\_\_ a week \_\_\_\_\_ times a week \_\_\_\_\_

i) Have pain

Not during the      Less than      Once or twice      Three or more  
past month \_\_\_\_\_ once a week \_\_\_\_\_ a week \_\_\_\_\_ times a week \_\_\_\_\_

j) Other reason(s), please describe

\_\_\_\_\_  
\_\_\_\_\_

How often during the past month have you had trouble sleeping because of this?

Not during the      Less than      Once or twice      Three or more  
past month \_\_\_\_\_ once a week \_\_\_\_\_ a week \_\_\_\_\_ times a week \_\_\_\_\_

What is your program of study (choose one):

Speech Pathology & Audiology \_\_\_\_\_ Occupational Therapy \_\_\_\_\_  
Nursing \_\_\_\_\_ Physician Assistant \_\_\_\_\_

Biking: \_\_\_\_\_

Yoga: \_\_\_\_\_

Running: \_\_\_\_\_

Weight lifting: \_\_\_\_\_

Swimming: \_\_\_\_\_

Do you feel you get enough exercise? Yes \_\_\_\_\_ No \_\_\_\_\_

Have you worn a pedometer before? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, why? \_\_\_\_\_

Approximately how many hours in a usual week do you spend in a classroom, clinical practice or work on the following days?

	Hours in classroom	Hours in clinical practice or lab	Hours working
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			

Approximately how tall are you (circle one)?

4' 10"

4' 11"

101-110#

111-120#

121-130#

131-140#

141-150#

151-160#

161-170#

171-180#

181-190#

191-200#

201-210#

211-220#

221-230#

231-240#

241-250#

251-260#

261-270#

271-280#

281-290#

291-300#

301-310#

311-320#

321-330#



## Appendix C

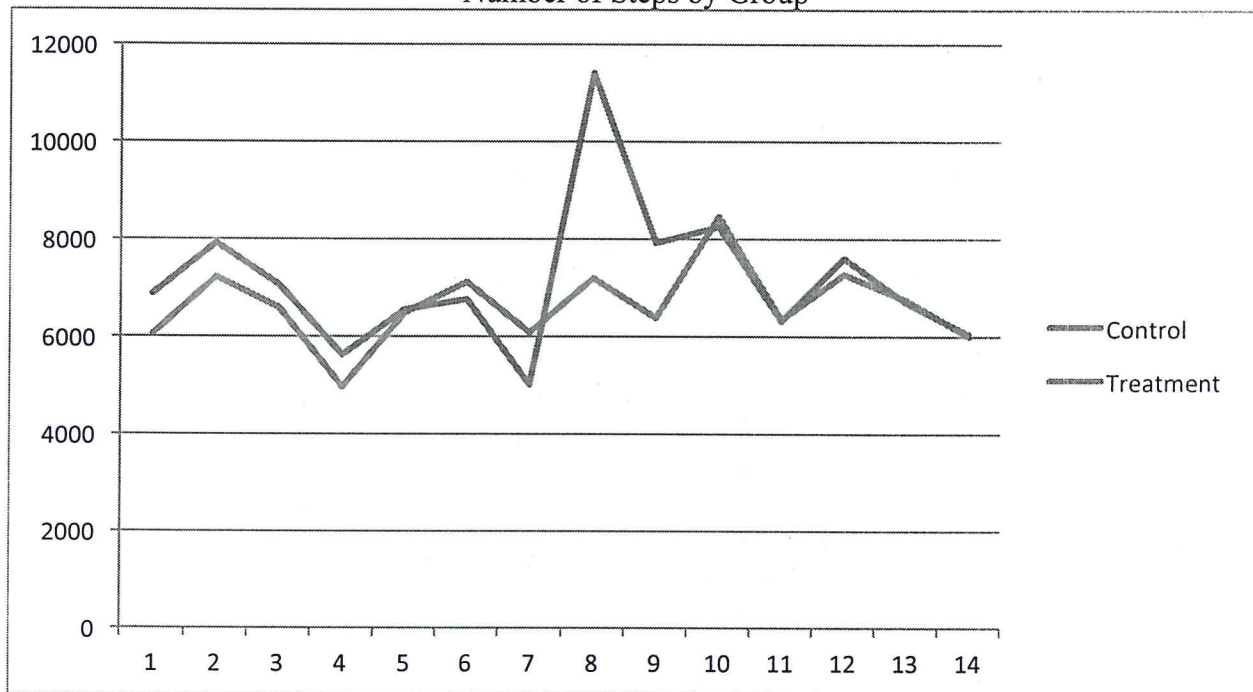
## Text Messages

<b>Day/Date</b>	<b>Time</b>	<b>Control Group</b>	<b>Treatment Group</b>
Sunday 01/27	9PM	Pedometer study starts tomorrow! Please wear your pedometer.	Pedometer study starts tomorrow! Please wear your pedometer.
Monday 01/28	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Tuesday 01/29	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Wednesday 01/30	4PM		Physical activity can make you feel happier. Enjoy your steps!
	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Thursday 01/31	4PM		You can feel proud of yourself for the steps you have taken!
	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Friday 02/01	4PM		Taking steps today may help you feel that you can cope with problems better.
	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Saturday 02/02	4PM		Increasing your number of steps can make you feel more energized!
	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!
Sunday 02/03	4PM		The steps you take today may make you feel more

			by 10PM!
Sunday 02/10	4PM		Increasing your steps each day can increase your self-esteem.
	9PM	What was your total number of steps for today? Please text it in by 10PM!	What was your total number of steps for today? Please text it in by 10PM!

## Appendix E

Number of Steps by Group



## Appendix G

Number of Participants That Achieved More Than 10,000 Steps by Day

Day	$\geq 10,000$ Steps
One	20
Two	20
Three	17
Four	10
Five	16
Six	19
Seven	13
Eight	19
Nine	17
Ten	23
Eleven	8
Twelve	14
Thirteen	12
Fourteen	10