

**North Dakota State University Student
Attitudes and Behaviors Toward Stair Usage**

Submitted to the

Red River Valley Research Cooperative

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Abstract

The presence of posters containing positive health messages can increase the attitudes and long-term behaviors of students towards stairs use in academic buildings (Gorsky, Krajewski-Siuda, Dutka, Berridge, 2010). Most adults have adopted a sedentary lifestyle and using the stairs is an easy way to increase physical activity throughout the day (Boutelle, Jeffery, Murray, Schmitz, 2001). Observations of student stair and elevator use will be recorded within three separate academic buildings on the North Dakota State University campus. In addition, a survey will be distributed to a range of students to collect an understanding of attitudes and behaviors towards stairs and elevator usage. The research found from this will provide awareness to campus students and be presented in a public document and oral presentation.

Introduction

Physical activity in adults is a psychological factor in their everyday lives. Posters may induce behavior changes that are consistently associated with one's attitudes by directing awareness toward stair usage (Hodgin, Graham, 2016). The purpose of this research is to explore the behaviors of North Dakota State University students and the attitudes they have toward stair usage within three different campus buildings, A. Glenn Hill Center, Barry Hall, and Sudro Hall. It uses the idea of health benefits through posters to try to change behaviors on campus. Physical inactivity is a major risk factor for many diseases like obesity and cardiovascular disease (Teh, Aziz, 2002). The results of this research can benefit students by increasing positive behaviors and attitudes towards healthy lifestyle options such as stair use.

Background

As unhealthy lifestyle habits increase in today's population, weight gain has been a prevalent issue in the world and as many as half a billion people today are obese (Dolan, Weiss, Lewis, Pietrobelli, 2005). The main cause of this issue is a sedentary lifestyle. Studies in epidemiology have shown a strong correlation between individuals with a sedentary lifestyle and having a higher rate of mortality and disease (Boutelle, Jeffery, Murray, Schmitz, 2001). This is a very common lifestyle and only a small portion of the population engage in regular exercise (Boutelle, Jeffery, Murray, Schmitz, 2001). Only 1 in 3 people admit that in their leisure time they participate in physical activity (Russell, Hutchinson, 2000). Although this is a major issue, there are many small steps people could take to reduce their risk of becoming obese. It is recommended that an individual is active for at least 30 minutes a day and one easy way to fulfill this requirement is by taking the stairs instead of the elevator (Lee, Perry, Wolf, 2012). Stair climbing is a vigorous form of physical activity. Climbing stairs can help improve cardiovascular fitness, increase amount of good cholesterol in the blood and decrease body fat (Teh, Aziz, 2002). When an individual climbs a flight of stairs, it costs about 8.5 kcal of energy, which then classifies it as vigorous physical activity (Engelen, Gale, Bauman, 2006). For example, an 80 kg individual using the stairs will burn 28 calories a day which is equivalent to losing three pounds of fat a year (Lewis, Eves, 2008). These studies show there are potential benefits of incorporating stair-climbing in our everyday lives. Previously discovered data has proposed that 79.9% of adults between ages 18 to 25 did not meet the recommended

requirements for physical activity including aerobic and muscle strengthening exercises (Hodgin, Graham, 2016). In order for individuals to meet the daily exercise requirements of 30 minutes a day, stairs are an easily accessible option for many people and helps build lower-limb muscle strength without having to go to the gym for the same results (Lee, Perry, Wolf, 2012).

However, considering the previous research done on the effects of stair usage using visuals have only been conducted in public settings such as worksites. It is still not clear whether signs alone are still effective in younger populations across different building types in North Dakota State University students. Conducting research on a smaller population such as NDSU students could provide additional data to the little information out there about the attitudes and behaviors towards stair use among NDSU college students. Therefore, studying the young, educated population in universities will help clarify whether signs alone are effective in promoting stair use in different university buildings.

Methods

Methods Justification:

One of the reasons people might not use the stairs is because they perceive visuals as unattractive. Previous studies have been done involving signs containing positive health benefit visuals to increase stair use. Visual reception competence can motivate people to physically take action from the perceived graphics (Mueller, 2008). Posters were originally used for advertising but were introduced in the twentieth century as a medium for spreading health messages (Gorsky, Krajewski-Siuda, Dutka, Berridge, 2010). Previous studies show that posters placed at a decision point can influence people to take the stairs (Boutelle, Jeffery, Murray, Schmitz, 2001). In 80% of those studies, motivational and directional signs significantly increased stair use (Engelen, Gale, Bauman, 2006). Since posters have been deemed effective to persuade individuals to take the stairs, the question is now, what is presented on the poster to make them do so. There have been many evaluations of health posters and how they modify behavior and it has been shown that they can contribute to improved positive health outcomes. However, sometimes posters have been shown to only produce limited and short-term change (Gorsky, Krajewski-Siuda, Dutka, Berridge, 2010). In a study involving mirrors placed by stairs, some students chose not to take the stairs after seeing themselves in the mirror because they believed that it would not positively impact their appearance and that they do not need to lose weight (Hodgin, Graham, 2016). Visual aids might not be helpful if there isn't a perceived problem in the first place (Galesic, Garcia-Retamero, 2013). Contrary to this, if there was an informative message alongside the mirror, then the individual would be more inclined to use the stairs. In an additional study, it was found that using descriptive norms in the message were an effective way to persuade the individual. Descriptive norms reflect typical behaviors in a collective community making the individual more inclined to follow this norm in hopes to get rewarded for doing so. This study found evidence that strategically placing descriptive norm within a message can lead to long-term changes in the individual choosing to take the stairs (Burger, Shelton, 2011). In addition to descriptive norms, there has been studies conducted on the complexity of the message at the decision point. These studies concluded that in a busy environment a simpler message was more effective than a more complex one (Lewis, Eves, 2008).

Design:

This study's primary research will consist of observations of stair and elevator use before and after the introduction of stair prompt posters. None of the studies published to date have evaluated the impact of same stair prompt on stair use across different building types (Lee, Perry, Wolf, 2012). The participants of this study will be college students at North Dakota State University in Fargo and the buildings to be evaluated are Sudro Hall, Barry Hall and A. Glenn Hill Center. The research team will be located near the foot of the stairs and elevators in the buildings during high traffic times, shortly before and after classes, to directly observe students. The research team will count the number of students entering the stairs and elevator but will exclude students carrying large items or who are not physically capable of using the stairs. An interobserver agreement has been implemented among the research team. This ensures that all members of the research team have agreed to follow the same counting design during the observation process. Posters will be placed near the elevator and this observation process will be repeated one week later.

Research will also be conducted using a survey. This survey will be administered through Qualtrics via the internet to NDSU students and will consist of a variety of questions that will gauge students' attitudes and behaviors towards stair use. Using a survey will provide the research team with knowledge that cannot be gained from observations alone.

Data Analysis:

A Chi-Square test will be performed with Excel, where we will determine whether numbers are significant to justify results of the data from the elevator and stair observations.

Conclusion

Research Qualifications

Each researcher is an undergraduate student at NDSU. Listed below are researchers and their credentials.

Sofia Abdullah

- Biology major, Chemistry minor
- Certified Nursing Assistant at Sanford Health for four years
- Taken psychology, sociology, and math (calculus & statics) courses

Morgan Gallagher

- Biotechnology major
- Healthy Herd Champion Member for two years
- Taken wellness, biology, math, and chemistry/biochemistry courses

Sydney Yingling

- Biology major, Chemistry minor
- Taken wellness, sociology, math and statistics courses
- Certified Nursing Assistant
- 2 years of research experience in the Reed lab on campus

Hannah Wittman

- Animal Science major
- Taken wellness, math, statistic, sociology, and psychology courses

Researcher Responsibilities:

Included in Figure 1 is a Gantt chart timelining tasks to be completed and their respective due dates.

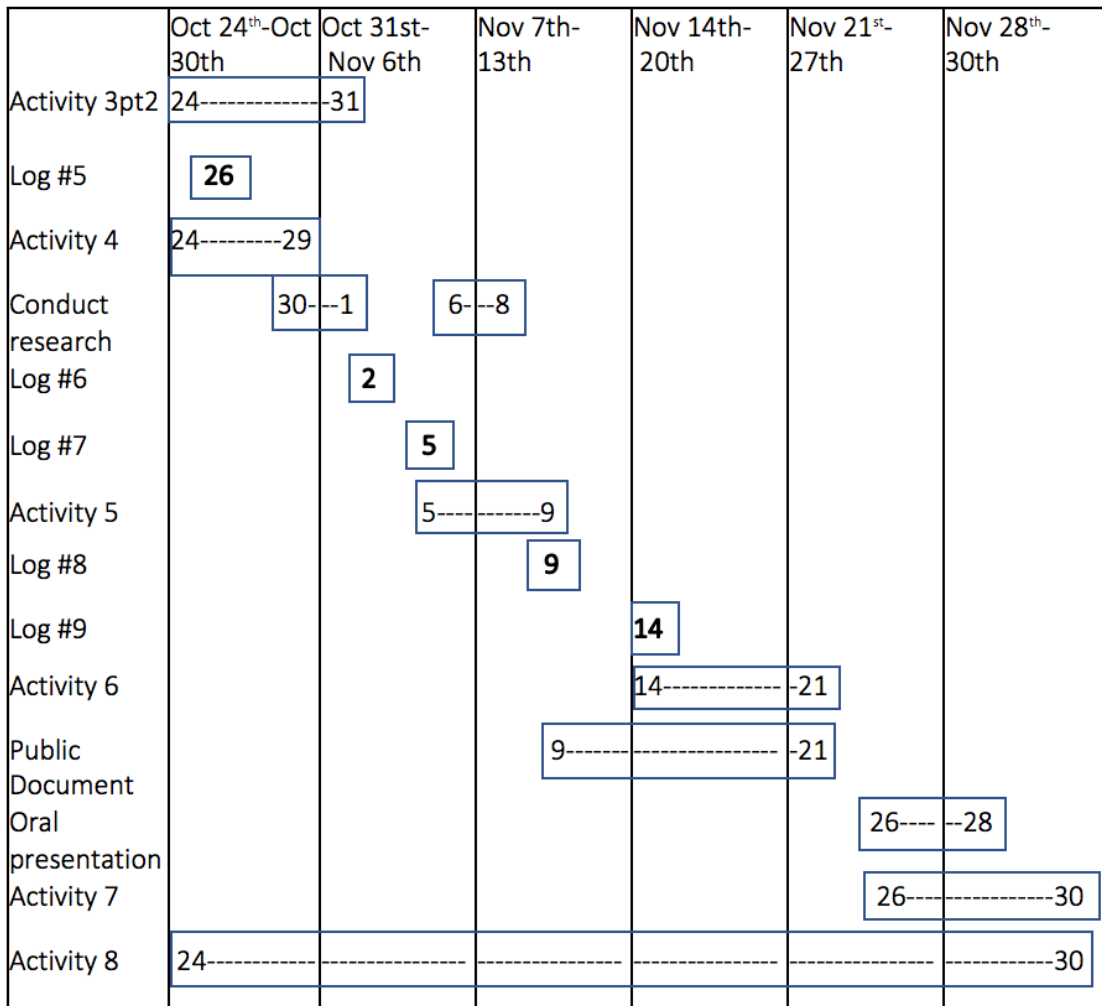


Figure 1: Gantt chart of our assignments and how long we will work on each one. Note that the single bolded days will be started and turned in within the day.

Researcher Materials:

All necessary materials needed for the research team are readily available and include, computers, internet, reliable transportation to get to and from buildings being observed, Qualtrics to construct and distribute surveys, and journals for data collection. Excel program and calculators are already owned by all members of the research team which will aid in the Chi-Square Analysis test.

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BURN CALORIES, NOT ELECTRICITY

A multi-building study

**By: Morgan Gallagher, Sydney Yingling, Sofia
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RESEARCH QUESTION

- Will the presence of visual aids change the attitudes and behaviors towards the use of stairs in NDSU students?



RRRCO

RED RIVER RESEARCH COOPERATIVE ORGANIZATION

DID YOU KNOW?

- Most young adults do not practise enough physical activity to benefit their health.
- The recommended is 30 minutes of exercise a day for college age students

SMALL STEPS ADD UP TO BIG GAINS

- Sedentary lifestyle and physical inactivity
- Only a small portion of the population engages in regular exercise.
- There are small steps that can be taken to prevent health problems and to increase physical activity.



WHY USE THE STAIRS?

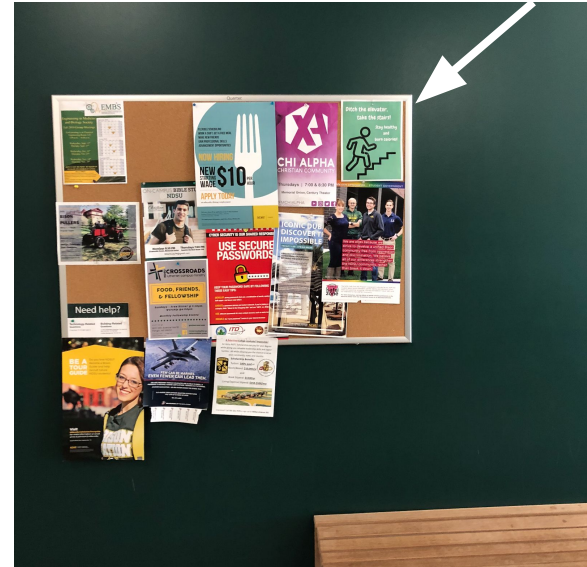
- Improvement of cardiovascular health
- Obesity
- Build lower limb strength
- Stairs are easily accessible
- Is classified as a 'vigorous exercise'

RESEARCH DIRECTION

- Only conducted in worksites and public areas
- Never conducted throughout multiple university buildings
- Provides a different environment and additional data

METHODS- OBSERVATIONS

- Participants?
- Which university buildings?
- Where were the signs placed and how?
- How were observations conducted?
- Interobserver agreement?



MOTIVATIONAL SIGN IN A. GLENN HILL CENTER

METHODS - SURVEY

- Qualtrics
- 81 student responses
- Why use a survey?

? %

Of students at NDSU students reported they prefer to take the stairs instead of the elevators.

85 %

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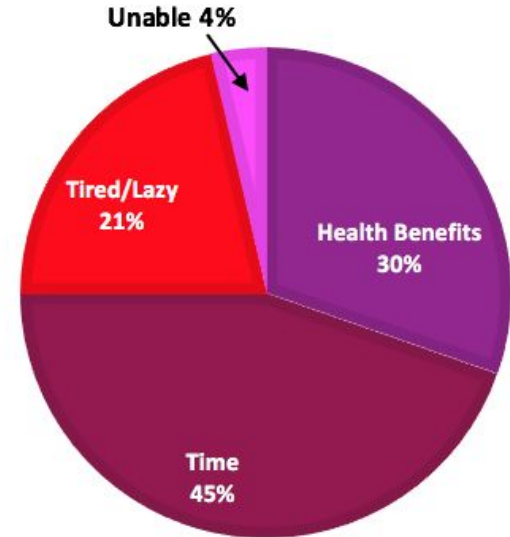
RESULTS

-NDSU students are active for 30 minutes on average of 3 days a week

-The #1 reasons why students choose stairs over elevator was convenience

-After posting the posters, stair usage increased by 19% and elevator usage decreased by 26%

STAIR VS ELEVATOR FACTORS



FOR THE FUTURE

- Additional data
- Create awareness for NDSU students about stair use
- Change students attitudes about stairs
- Improve the health of students

WANT TO FIT IN SOME EXERCISE, BUT DON'T HAVE TIME TO
HIT THE GYM?

Simply head to your nearest
staircase

QUESTIONS?

STAIR CLIMBING FACTS

According to Duke University, stair climbing can increase the amount of "good cholesterol" in the blood.

Stair climbing throughout the day can significantly contribute to the recommended 30 minutes of exercise.

CAN TAKING THE STAIRS HELP ME LOSE WEIGHT?

Yes, taking only two flights of stairs a day can help you lose around six extra pounds a year.



According to a recent study conducted at NDSU, 86% of NDSU students prefer to take the stairs.



When climbing the stairs you burn twice the amount of calories than if you were to run for the same amount of time.

Taking the stairs can help relieve stress and tension.

Taking the stairs instead of the elevator or escalator burns calories, not electricity.

Keep a straight posture while taking the stairs to avoid injuring your lower back.

Climbing the stairs burns 8-11 calories per minute.

WHAT ARE THE BENEFITS TO TAKING THE STAIRS?

- Fitness level increases
- Higher aerobic capacity
- Increases leg strength
- Helps maintain healthy body weight

Seven minutes of stair climbing a day can halve the risk of heart attack over ten years

Stair climbing lowers the risk of developing many chronic conditions including diabetes and heart disease.

Brought to you by the Stairs vs. Elevators Research Team.

Please direct any questions or concerns to : Research-Team@ndsu.edu

References:

Benefits of Taking the Stairs– Duke University

Tips and Warnings– Duke University



NDSU