



# STAIRWELL: INCREASING ACTIVITY AMONG NURSING STUDENTS AND FACULTY

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## ABSTRACT

**Objective:** To promote increased activity as measured by stair use frequency among nursing students, faculty and staff using a prospective quasi-experimental pre-post-test design. **Background:** The American Nurses Association declared 2017 the Year of the Healthy Nurse and encouraged increased activity because nurses and nursing students have an average Body Mass Index (BMI) of 27.6 indicating overweight, and less than half participate in recommended quantity and time in exercise. Data support aerobic exercise increases cognitive function yet, nursing lectures range from 2-10 hours of sitting a day; staff and faculty spend 6-10 hours sitting at the computer, regular stair climbing burns more calories per minute than jogging. Thus, stair use could improve health and cognition among students, staff, and faculty. **Methods:** Data were collected from 6 floors of the school over 12 weeks (baseline 4 weeks; post intervention 8 weeks) using 6 people counter directional (PCD) sensors placed on multiple floors of the two stairwells with data recorded daily by research staff. Intervention included stairwell sanitation, motivational signage, and colorful door wraps. Post intervention data were collected with PCD sensors and an anonymous survey to students, faculty and staff. Data were analyzed with t tests by each day of week and descriptive statistics for survey data. **Results:** Mean number of people using stairs up increased from baseline to intervention on Wednesdays and Thursdays; from 53 to 61 people and 54 to 72 people, respectively. Mean number of people using stairs down increased from baseline to intervention on Wednesdays and Thursdays; from 87 to 103 people and 60 to 83 people, respectively. Survey participants (n=133; 19% response rate) were 86% female, 81% students, 13% staff and 6% faculty, with 33% white and age 20-24 years. "Always use" of stairs increased from 29% to 37%, "stair use for exercise" increased from 61% to 78%, 59% agreed intervention increased their stair use and 49% reported using the stairs for multiple floors. Faculty survey respondents did not report increased stair use following intervention. **Conclusion:** Nursing staff and student participants reported increased use of stairs as exercise following intervention which reflects the people count data, indicating interventions increased stairwell usage, although this increase was not significant. A cleaner, more inviting stairwell promotes use and thus physical activity among nursing students and staff. Faculty reported no increase in stair use suggesting limited activity levels and room for improvement. Research funded in part by Healthy Campus Initiative, UCLA.

## BACKGROUND

- ❖ The ANA declared 2017 the Year of the Healthy Nurse and encouraged increased physical activity
- ❖ Nurses and nursing students' average body mass index is 27.6 (overweight), and less than 50% participate in weekly recommended exercise quantity/time:
  - 150 minutes moderate-intensity physical activity *OR*
  - 75 minutes vigorous physical activity
- ❖ Aerobic exercise increases cognitive function; *yet*, nursing school lectures range from 2-10 hours of sitting/day, staff and faculty spend 6-10 hours sitting at the computer/day.
- ❖ Stair climbing burns more calories/minute than jogging.
- ❖ Effects of stair climbing on cardiovascular system meets the American College of Sports Medicine's minimum physical activity intensity requirement for health gains.
- ❖ Stair use could improve health and cognition among students, staff, and faculty.

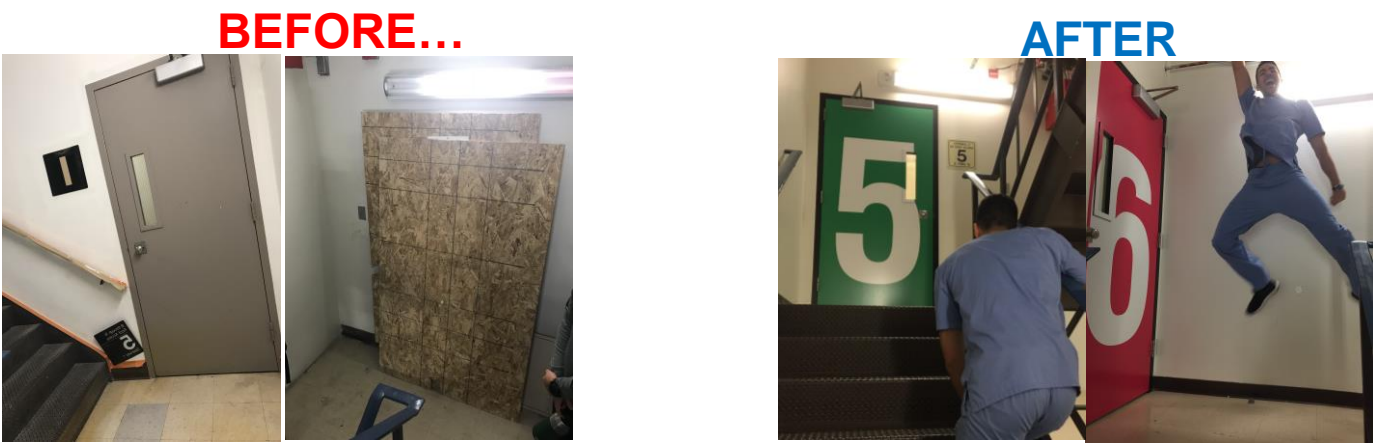
## OBJECTIVE

To promote increased activity measured by stair use frequency among nursing students, faculty, and staff using a prospective pre-experimental pre-post-test design.

## METHODS

- ❖ Part of the UC Healthy Campus Initiative.
- ❖ Uncontrolled before-and-after study examining usage of stairs in UCLA School of Nursing building between February 2018 and June 2018
- ❖ Intervention: motivational point of decision signage, sanitation of stairwell, and colorful door wraps.
- ❖ Data collected using 6 directional people counter devices (PCDs) and an anonymous on-line post-intervention survey to students, staff, faculty. Baseline data collected for 2 weeks, follow-up data for 10 weeks.
- ❖ Using SPSS Statistics, sensor and survey data analyzed with descriptive statistics, ANOVA and t-tests.

## RESULTS



- ❖ Data analyzed for stair use by day of week and by comparing first two weeks post-intervention to baseline
- ❖ Mean number of people using stairs up & down increased on Wednesdays and Thursdays,
  - UP: 53 to 61 (Wed) and 54 to 72 (Thur)
  - DOWN: 87 to 103 (Wed) and 60 to 83 (Thur)
- ❖ When data standardized for number of people in the building, the number of people going up and down stairs on Wednesday significantly increased (both  $p \leq 0.01$ ). Other days were not significant.
- ❖ An increase in standardized stair use pre-intervention (wk 2) to post-intervention (wks 3 & 4) existed for:

Day	UP Mean	DOWN Mean
TUESDAY	0.13 vs 0.3 ; P=0.05	018 vs. 0.39; P=0.05
WEDNESDAY	0.32 vs 0.57; P=0.10	0.38 vs 0.95; P=0.003
THURSDAY	0.13 vs 0.28; P=0.28	0.17 vs 035; P=0.8

❖ *As post-intervention progressed, no difference existed compared to baseline stair use*

**Table 1 Demographic Characteristics of Survey Respondents (n=133)**

Characteristic	Mean (SD) or N (%)
Female gender	115 (86.5)
Age	
<20 years	12 (9)
20-29 years	71 (53.3)
30-39 years	26 (19.5)
40-49 years	13 (9.8)
50+ years	11 (8.3)
Ethnicity/Racial groups	
African American	7 (5.3)
Asian American/Pacific Islander	43(32.3)
Caucasian	43 (32.3)
Hispanic/Latino	29 (21.8)
Multiracial	11 (8.2)
School Affiliation	
Faculty	7 (5.3)
Staff	17(12.8)
Students	109 (81.2)
BS (Bachelor of Science in Nursing)	37 (33.9)
MECN (Master's Entry Clinical Nurse)	39 (35.8)
APRN (Advanced Practice Registered Nurse)	26 (23.9)
PhD	7 (6.4)

**References:** American Nurses Association (2013). Executive Summary: American Nurses Association Health Risk Appraisal. Ang, F. T., Berardi, V., & Rosenberg, B. D. (2018). The Effects of Health-Promoting Signs Encouraging Stair Use in Parking Structures. Hodgkin, K. L., & Graham, D. J. (2016). Mirror, mirror by the stairs: The impact of mirror exposure on stair versus elevator use in college students. *Frontiers in Public Health*, 4,80. Teh KC, Aziz AR. Heart rate, oxygen uptake, and energy cost of ascending and descending the stairs. *Med Sci Sports Exerc* (2002) 34(4):695–9.

## RESULTS

### CHANGES IN STAIR USE BEFORE & AFTER

- ❖ The 50+ age group had the greatest proportion of respondents who self-reported an increase in stair use after the intervention (54.6%; n=6).
- ❖ The 40-49 year-old group showed the least improvement in self-reported stair use (7.7%; n=1).
- ❖ No significant difference found for changes in stair use based on gender or ethnicity/racial group

**Table 2 Comparison of Self-Reported Percent of Time Stairs Used Pre and Post Intervention, by Affiliation**

Affiliation	BS	MECN	APRN	PhD	Faculty	Staff	P Value**
	Mean (SD)						
Self-reported % of time* stairs used* baseline	3.53 (1.156)	4.30 (0.648)	4.04 (0.916)	4.14 (0.900)	3.00 (1.155)	3.33 (1.113)	<0.001 (F 3.55)
Self-reported % of time stairs used post-intervention	3.82 (1.010)	4.43 (0.636)	4.15 (0.881)	4.14 (0.900)	4.00 (0.756)	3.82 (0.086)	0.047 (F 4.92)
Difference in % of time stairs used	0.289 (0.515)	0.125 (0.686)	0.115 (0.588)	0.000 (0.000)	1.000 (0.816)	0.466 (0.516)	0.005 (F 2.32)

\*percent of time stairs used measured on where 1 = "never" 0%; 2 = "seldom" 25%, 3 = "sometimes" 50%, 4 = "often" 75%, and 5 = "always" 100%.

\*\*ANOVA across affiliation groups by time (before intervention, after intervention & by difference in % used)

- ❖ Pre-Intervention, MECN students reported significantly higher stair use than BS students, faculty, and staff (p=0.008, 0.018, and 0.017 respectively). There were no other significant differences in stair use across affiliations before the intervention.

### REASONS FOR TAKING STAIRS BEFORE & AFTER

- ❖ The percentage of respondents reporting stair use for exercise benefits increased from 61.7% (n=82) baseline to 78.2% (n=104) after the intervention.

### FAVORITE MOTIVATIONAL SLOGANS

- ❖ Favorite motivational slogan, by age group
  - Under 20 years: *"Push yourself, not the button. Taking the stairs promotes fitness and conserves electricity."*
  - 20-29; 30-39: *"Regular stair climbing burns more calories per minute than jogging."*
  - 40-49; 50+: *"Skip the gym; take the stairs"*
- ❖ Favorite motivational slogan, by school affiliation
  - APRN, PhD students, staff: *"Skip the gym; take the stairs"*
  - Faculty, MECN students: *"Regular stair climbing burns more calories per minute than jogging."*
  - BS students: *"Push yourself, not the button. Taking the stairs promotes fitness and conserves electricity."*

### FAVORITE STAIRWELL IMPROVEMENTS

- ❖ 71.4% of respondents selected "bright colors" as one of their favorite stairwell improvements
- ❖ "Stairwell door wraps" was the next most selected choice (63.2%), followed by "motivational signs" (61.7%) and "painting of walls and handrails" (51.1%).
- ❖ **SELECTED FREE RESPONSE SURVEY COMMENTS**
- ❖ "I really enjoy [the improvements]; motivational and reminds me to get my fitness in while I can even during busy days."
- ❖ "I think it's definitely a step in the right direction in creating a built environment that promotes health, wellness, physical activity, and overall promotion of health."
- ❖ "It has helped me to locate the stairs."

## LIMITATIONS

- ❖ Pre- and post-intervention data were collected during different quarters, Winter and Spring, respectively. Variance in daily schedules for class and work between these two quarters was not controlled for in students, faculty, and staff.
- ❖ Survey responses may not reflect actual stairwell usage.
- ❖ Use of only 6 PCDs in two stairwells limited our ability to conduct more robust analysis.

## DISCUSSION

- ❖ Survey data indicated ALL groups self-reported increased stair use, PCD data did not fully support this.
- ❖ On Wednesdays, APRNs increased stairwell use after intervention, suggesting practicing nurses may understand the importance of regular physical activity.
- ❖ The initial two weeks post-intervention saw an uptick in stair use that quickly returned to baseline levels, indicating the intervention intensity needed to be more aggressive for behavior change to be sustained.
- ❖ The slogan "Skip the Gym: Take the Stairs" was most motivational for those who currently hold an RN license (APRN and PhD students). This finding should promote further research into differing motivational and contextual dynamics for pre- and post-licensure individuals.

## CONCLUSION

Nursing staff and students reported increased stair use as exercise post intervention which reflects people count data, indicating interventions increased stair use, although not significant. A cleaner, more inviting stairwell promotes use and physical activity among nursing students and staff. Few faculty participated suggesting limited activity levels and room for improvement. Increased use not sustained over time. Research funded in part by Healthy Campus Initiative, UCLA.