April 2015

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Ehn, Monica, "Injunctive and Descriptive Norm Effects on Physical Activity" (2015). Graduate Student Symposium. 18.
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Injunctive and Descriptive Norm Effects on Physical Activity
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Abstract

This study investigated the application of focus norm theory to exercise using a non-self-report method. Focus norm theory states that when individuals are faced with an ambiguous issue, descriptive and injunctive norms are tentative, the current study incorporated popular and innovative technology which could help lead to more precision in measuring physical activity. Descriptive and injunctive norms provide more accessible to a diverse population. Effective and accessible interventions could help reduce the rate of overweight and obesity and increase the health and quality of life for a substantial portion of adults in the United States.

Introduction

Regular physical activity has many physical and psychological benefits such as fewer cardiovascular disease, depression, obesity, and improved cognitive functioning (US Department of Health and Human Services, 2008). In 2012, only 20.8% of adults in the US met the guidelines for both physical activity and strengthening activities and 46.6% of American adults met neither the aerobic activity nor the muscle strengthening guidelines (National Center for Health Statistics, 2014). While physical inactivity is not the sole cause of obesity, physically inactive adults have an increased risk of becoming overweight or obese (US Department of Health and Human Services, 2008). Excess body weight also has serious health and financial consequences (Field et al., 2001). Obesity and overweight adults have an increased risk for developing diabetes, gallstones, hypertension, heart disease, high cholesterol and stroke compared to normal weight adults (Field et al., 2001). Social influence is the process of change in an individual’s thoughts, feelings, attitudes, or behaviors as a result of interactions with others (Roshette, 2006).

Several exercise interventions at the personal, workplace, and community levels can be used to increase physical activity. However, the effects of exercise interventions often decline shortly after the intervention ends (Church et al., 2015). Therefore, there is a pressing need for interventions that are, at the very least, cost effective and easily administrable. Social influence may be one additional method for increasing physical activity. Focus normative theory further states that there are two types of norms, descriptive norms and injunctive norms. A descriptive norm is a person’s perception of what the majority of people do. An injunctive norm is what one believes is expected or preferred by a peer group. Focus normative theory is viewed as an additional element that could be used in designing efficient, effective, and easily accessible exercise interventions.

Hypotheses

Participants recorded how often they participated in physical activity for four weeks using the Fitbit Zip pedometer. Participants received either descriptive or descriptive plus injunctive feedback. A multimedia messaging service (MMS) was sent via email to the participant’s mobile phone. Broadly, it was expected that normative feedback groups would differ on the key outcome variables, such that:

Hypothesis 1: Participants would increase number of steps from week 1 to week 2 of the study as a result of self-monitoring via the Fitbit Zip pedometer.

Hypothesis 2: Regardless of condition (descriptive or injunctive feedback), participants would show no change on the normative feedback condition over the four-week study.

Hypothesis 3: Participants would change the norm for weeks 1 and 2 in the descriptive norm condition would decrease number of steps for week 3 and 4 of the study after receiving the normative feedback.

Hypothesis 4: Participants in the descriptive plus injunctive norm condition would change the descriptive norm condition for week 3 and 4 of the study.

Method

Participants

Fifty two undergraduate students with a mean age of 18.66 (SD = 0.83) from a Midwestern university were recruited in this study. Participants were recruited from the university’s online participant pool; they received credit for participation toward their Introduction to Psychology course.

Procedure

Participants were issued a Fitbit Zip pedometer for the duration of the current study. The Fitbit Zip wireless activity tracker is a pedometer that tracks number of steps, distance, and calories burned. The Fitbit Zip uploads the information wirelessly to Mac or PC computers via a USB component that plugs into the computer’s USB port. The Fitbit Zip also syncs to supported mobile phones using Bluetooth. The Fitbit Zip stores minute-by-minute data for seven days and a total daily for 23 days until the device is synced to a computer. For the current study, the Fitbit Zip was used to track participants’ number of steps which was used as the dependent variable. The number of steps was used as a non-self-report measure of physical activity prior to and following exposure to normative feedback.

Normative feedback was delivered 15 and 22 days after beginning participation. The normative feedback delivered on day 15 was the average number of steps of all participants for week one and two of the study (M = 35745.00, SD = 42678.19). The normative feedback delivered on day 22 was the average number of steps of all participants for week two and three of the study (M = 37713.75, SD = 45314.72). Bar graphs that compared the mean number of steps and each participant’s number of steps for the respective week were created. A graph icon was added to the graph was created and sent to the participants’ mobile phone as a multimedia messaging service (MMS) picture message. The descriptive feedback graph included the bar graph that showed participants their average number of steps per week in comparison to the average number of steps per week of the typical university student. The descriptive plus injunctive feedback graph also included the bar graph with an additional smiling or frowning emotion. Schultz and colleagues (2007) used this same manipulation to look at the effects of normative information on energy consumption (See Figure 1).

Procedure

Participants completed the self-administered long form of the International Physical Activity Questionnaire (IPAQ-L; The International Physical Activity Questionnaire, 2002). The IPAQ-L is a 27 item self-report measure of physical activity that measures five domains of physical activity including job-related physical activity; household, housework, and care giving for family; transportation to and from physical activity; recreation, sport, and leisure-time physical activity; and time spent sitting. For the purposes of this study, the “usual week” and English version of the IPAQ-L was used. Participants were asked to answer questions such as “Not counting any walking you have already monitored, during a usual week, on how many days do you walk for at least 10 minutes at a time in your leisure time?” Items are fill-in-the blank with number of minutes per day, hours per week, and days per week (The International Physical Activity Questionnaire, 2002). For the current study, the IPAQ-L assess self-reported past physical activity as a control to note any group differences in physical activity prior to the recording of steps via pedometers. The IPAQ-L responses were converted into calories using a standardized formula. These caloric indices were used for all subsequent analyses.

Data Analysis

All statistical analyses were conducted using SPSS version 25.0. The Shapiro-Wilk test was used to assess normality of the variables. The mean and standard deviation (SD) were calculated for the descriptive and injunctive norm conditions for week 1, week 2, week 3, and week 4. The median and interquartile range (IQR) were calculated for the descriptive and injunctive norm conditions for week 1, week 2, week 3, and week 4. A repeated measures analysis of variance (ANOVA) was conducted to determine if there were differences in number of steps between conditions and weeks. A Bonferroni adjustment was conducted for follow-up analyses to control for type 1 error.

Results

Consistency of the data was missing. The descriptive norm condition (63.3%) had more missing data than the descriptive plus injunctive norm condition (36.7%).

The first hypothesis was not supported as there was a statistically significant median decrease in number of steps (5340.5) decreased from week one (Mdn = 29056.00) to week two (Mdn = 25734.00), z = -0.71, p = 0.50, or from week two to week three in the current study. The descriptive norm condition also was not supported as there was a statistically significant median increase in number of steps from weeks one and two (Mdn = 26842.00) to week three (Mdn = 30248.00), z = -2.18, p = 0.04, or week four (Mdn = 22890.00). For the descriptive plus injunctive condition, the descriptive norm conditions after the week long university holiday. The third hypothesis was partially supported as there was a statistically significant median decrease in number of steps from week one and two (Mdn = 37968.00) to week three (Mdn = 30558.00), z = -2.18, p = 0.03, or 0.48, but there was no statistically significant median increase in number of steps from week three (Mdn = 26893.00) to week four (Mdn = 28587.00), z = -0.64, p = 0.52, or 0.14.

The fourth hypothesis was not supported as there were not statistically significant differences between the two conditions for week three, U = 254.00, p = 0.77, or week four, U = 253, p = 0.79, or 0.04.

Conclusions

This study investigated the effects of normative feedback on physical activity.

The second hypothesis that, regardless of condition (descriptive or injunctive feedback), participants below the norm for weeks one and two would increase their number of steps for week three and week four of the study was supported.

The third hypothesis that participants above the norm for weeks one and two in the descriptive norm condition would decrease number of steps for week three and week four of the study was supported.

The fourth hypothesis that participants in the descriptive plus injunctive norm condition would take more steps than participants in the descriptive norm condition for week three and week four of the study was supported.

Limitations

The current study was underpowered. The number of participants was small (n = 52) and eight participants were dropped from the study resulting in an even smaller sample size (n = 44). The sample size was not increased as there was not a statistically significant median decrease in number of steps for week four (Mdn = 30248.00), z = -2.18, p = 0.04, or week four (Mdn = 22890.00), z = -2.18, p = 0.04.

Several participants did not respond to the manipulation check which accompanied the normative feedback message suggesting that the normative feedback was not utilized by all participants. This limits the ability to test the application focus normative feedback to exercise behavior. However, the effects of exercise interventions often decline shortly after the intervention ends (Church et al., 2015). Therefore, there is a pressing need for interventions that are, at the very least, cost effective and easily administrable. Social influence may be one additional method for increasing physical activity. Focus normative theory is viewed as an additional element that could be used in designing efficient, effective, and easily accessible exercise interventions.

Future Directions

The current study requires further replication as the current study had a large amount of missing data and the results are inconsistent with focus normative theory and previous research.

Future research may seek to further investigate the use of technology in exercise interventions.