Physical Activity Impacts Health Outcomes and Medical Costs: A Longitudinal Study

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INTRODUCTION

Physical activity has been established as an important determinant of health[1]. Numerous studies have implicated the importance of physical activity in reducing health problems such as obesity[1], cardiovascular disease[3,4], hypertension[9], diabetes[5], cancer[6], osteoporosis[7], anxiety[8], depression[8], and premature death[2]. Physical activity a negative relationship between medical claims cost and physical activity[10].

While many cross-sectional studies have indicated the importance of physical exercise to health outcomes and medical claims cost, few have examined the effect of increased physical activity over time. More longitudinal studies are needed to provide a more extensive look into factors surrounding the impacts of physical activity.

Purpose of Study: This study examines the relationship between physical activity, biometric health outcomes, and medical claims cost among working adults.

METHODS

Data from 5,060 participants from a large US medical insurer in the Southeast were collected and analyzed over a three-year period running from January 2011 to December 2013. All participants were working and were covered by employer-sponsored health insurance. Participation in the activity tracking program was voluntary and was part of the organization's incentivized wellness program.

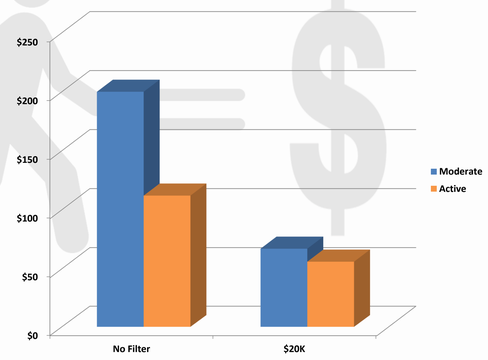
Physical activity was measured using a wireless, shoe-based accelerometer that tracks steps, distance, and time in motion. The physical activity data used for this study were average steps per day. Medical claims data and biometric screening data were obtained from the medical insurer and wellness provider, respectively.

Physical activity levels were divided into three categories, based on average daily step count:

- Active (7,500+ steps per day)
- Moderate (5,000 - 7,499 steps per day)
- Sedentary (less than 5,000 steps per day)

RESULTS

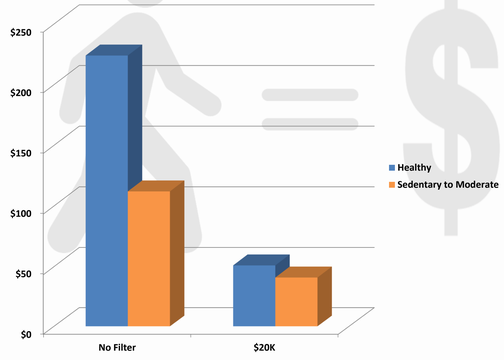
Complex sample frequencies and logistic regression analysis were utilized to calculate cost estimates and odds ratios.



Average General Claims Savings "No Filter"	Sedentary
Moderate	$200
Active	$112

Average General Claims Savings "20K Filter"	Sedentary
Moderate	$67
Active	$56

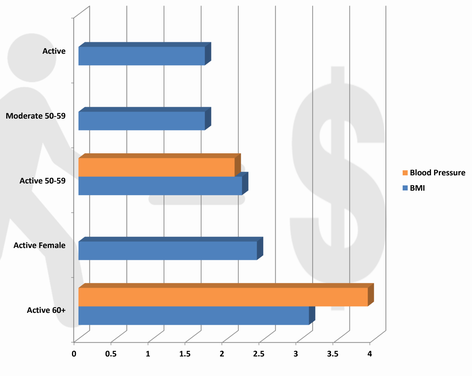
Having moderate physical activity levels was associated with **19%** lower medical costs



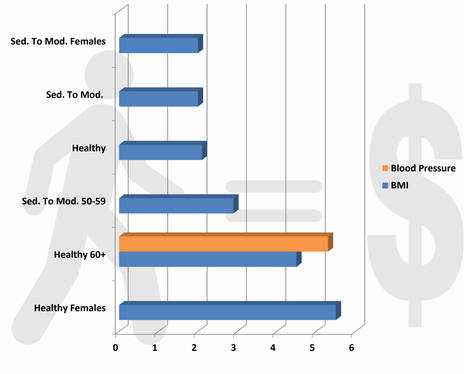
Average Change Claims Savings "No Filter"	Unhealthy 5000
Healthy	$224
Sed. To Mod.	$112

Average Change Claims Savings "20K Filter"	Unhealthy 5000
Healthy	$51
Sed. To Mod.	$41

A change from a non-active lifestyle to a moderately active lifestyle brings about a reduction in health care costs by **41%**, in one year's time.



General Category	Total	Male	Female	60+	50-59	40-49**	30-39**	18-29**
Non-Participants ***	1888	537	1351	281	487	525	450	145
Sedentary	4672	1174	3498	335	985	1480	1415	457
Moderate	304	114	190	33	118	96	50	7
Active	84	47	37	17	40	21	0	6



Change Category	Total	Male	Female	60+	50-59	40-49**	30-39**	18-29**
Sed. to Active***	3	1	2	0	1	1	0	1
Sed. to Mod.	139	59	80	11	47	47	30	4
Healthy	44	21	23	8	15	14	6	1
Unhealthy 5000	1060	269	791	92	206	374	279	55
Unhealthy 2500	542	100	442	34	122	190	159	37

CONCLUSIONS

Our research supports the current literature noting exercise as a highly effective tool for reducing health risk such as obesity and hypertension. This study also demonstrates that changes in this health risk can occur in a relatively short period of time. Markedly, the positive changes in health risk are more exaggerated in mid-life and older adults. This significant association between physical activity and lowered odds of obesity and hypertension suggests the need to consider physical activity programs aimed at the working adult population should be considered.

Most notably, our research illustrates the beneficial impact of physical activity on underlying medical costs. This finding suggests that there is a vital link between physical activity and health risk that could be fiscally beneficial to medical insurers and government entities. Increasing physical activity programs aimed at working adult populations should reduce their health risk profile and therefore result in lowered medical costs.

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