

What Can Exercise Do For You?

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Research Paper

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Abstract

The research conducted was limited to one school setting. The purpose behind this research was to find out if a physical activity program was needed to help the teachers of the school to lower their perceived levels of stress and to maintain a healthy atmosphere. While conclusions have been made, further research may be needed to validate any such program and its results. There were a total of thirty participants in this study.

Introduction

The importance of regular exercise has long been documented. The effects exercise has on one's overall physical and mental well-being are undeniable. Despite growing evidence, however, people are not always willing or able to put in the necessary time and effort to ensure that they schedule and follow an exercise plan.

When my best friend and I were in middle school, his family bought a small fast food restaurant. Everything on their menu was delicious. People raved about the quality of food, the value, and the generous portions. I look back on that restaurant as a large part of my adolescence, as we spent a great amount of time there enjoying not only the food, but the atmosphere as well.

My friend who is approximately five feet nine inches tall, found his weight ballooning over the course of the next several years. By the end of our freshman year in college, his frame was supporting upwards of two hundred and thirty pounds. Years of working six days a week in a fast food restaurant, going to school, and not actively working out had completely transformed his body. That summer, he decided to do something about it, and so he began watching his diet, and because I was participating in

sports and needed to continue my vigorous workout schedule, he agreed to go the gym to workout with me. By the summer's end, he had lost nearly fifty pounds and was feeling much better about his new and improved self.

Shortly after college, my best friend took a good paying, but stressful accounting job. His family still owned the restaurant, and any free moment he had, he would go in and help his parents. His long hours and heavy workload made working out much more difficult. He did, however, manage to continue monitoring his diet, although he now admits there were times that he simply could not manage all of the things he ate. His weight fluctuated for the next several years between one hundred and eighty pounds and 01two hundred pounds. Then, a few years ago, his father suffered a heart attack. Luckily, family members were able to get him to a hospital where the staff immediately began procedures to keep him alive. I am happy to say that they were successful, and now his father is doing well, although today, he is a much more subdued individual. This life-changing event made my friend again evaluate the practices of his own life.

The restaurant was sold shortly thereafter, and while I will never eat another hamburger as good as the ones I had there, I believe that the members of their family are healthier because of not consuming such food. The stress from owning and running the restaurant is also no longer evident. My friend and I have been going to the gym again for the last two years. Today, his weight is down to one hundred and fifty five pounds. He feels great and his friends have all been amazed and inspired by his newest transformation.

About a year ago, we were at the gym when a young woman caught the eye of my friend. After a few months and a lot of prodding and jokes by his friends, he finally

decided to ask her out. I found out that she, too, is a teacher. She was telling me one day that the teachers in her building decided to begin a “Biggest Loser” competition. While she by no means appeared to be overweight, she decided to join the competition as a motivating tool to continue a regimented exercise routine. She said that the competition was a genuine success, although there was some taunting among the teachers. (They would purposely leave chocolate lying around so that others might lose their self-control).

Hearing about her staff and their weigh competition set thoughts in motion for me about the staff members in my own building. I work in a building with a relatively young staff. Most of our staff members look fit, and I have overheard numerous conversations taking place about their latest workouts from boxing to yoga, from lifting weights to the various aerobics classes they are taking. Working out has always been an important part of my life. I like to think that it keeps me balanced, not only physically, but mentally as well. I am lucky enough to have a wife who supports this, and allows me to spend a good portion of time at the gym working out. I wanted to see if other teachers felt this way, and if so, how many of them actually worked out and what effect did the workouts have on their perceived levels of stress. I also wanted to see from where they felt most of their stress came, be it work, home, or some other source. Lastly, I wanted to find out if teachers would support a workout program geared specifically for them - a kind of “intramurals for teachers”...

Background

To begin, I thought it would be beneficial for me to find research done in this particular field. My research supported my thesis that a routine exercise program can be

very beneficial to the mind and body... One group of researchers studied cortisol levels in elite athletes, semi-professional athletes, and untrained athletes. They found that the levels of cortisol were lowest in the elite athletes, but that even the untrained athletes had fairly low levels based on their various workouts. The article stated,

In summary, our data suggest that the level of physical activity differentially influences the physiological and psychological reactivity to psychosocial stress. Interestingly, the reactivity of the sympathetic nervous system to stress was revealed to be sensitive to higher levels of physical activity (elite and amateur sportsmen), whereas cortisol responses were attenuated only in elite sportsmen. (Rimmele, Seiler, Marti, Wirtz, Ehlert, & Heinrichs, 2009).

Another article I looked at talked about integrating a workout program for employees. This research was conducted in Norway, and found evidence that would support an exercise program at work. The article states,

The Integrated Health Programme may be of use to employers who want to increase job satisfaction and well-being among their employees based on the positive subjective effects reported by the intervention group. In view of the large increase in sick leave in both groups during the intervention, this recommendation may be questioned, but we have no cause to believe that the increase in sick leave was connected to the intervention. Nevertheless, considering the positive subjective effects found in this study and the strong data on the association between employee health and job satisfaction, the Integrated Health Programme may have a positive effect on employee health in the longer run.”(Tveito & Eriksen, 2008).

As I continued my research, I found another interesting article. This looked at stress levels among adolescent students and whether physical activity helped to reduce those levels. The study looked at Norwegian and Swiss teens, and the outcome was somewhat surprising. They found that physical activity may not always solve stress related conditions. It seems that culture itself can impact one's overall stress levels. The article states,

Furthermore, it may be that physical activity and self-esteem are less able to buffer school-based stress in Switzerland because of considerable differences in school systems compared to Scandinavian countries. Whereas Swiss students are separated according to their academic performance after primary school, they remain in the same class until the end of mandatory school in Scandinavia. As a consequence, Swiss students are at higher risk of making wrong decisions about their future education at early stages or repeating a grade because of poor academic achievement. Since research shows that coping resources and environmental demands must fit to have a protective impact, it may be hypothesized that physical activity does not work well in the Swiss setting because the nature of school-related pressure is different compared to Norway where physical activity seems more able to compensate for school-based stresses. In addition, cross-cultural studies point to important differences concerning the life circumstances between both countries. For instance, Swiss adolescents receive more family support, spend less time with friends during leisure time, go out less frequently, play more often an instrument, and watch less TV than Norwegian peers. Thus, it is possible that among Swiss students, other resources

such as social support or perceived academic mastery play a more important role as stress buffers than physical activity and general self-esteem.” (Gerber & Puhse, 2008).

The next article I found seemed daunting academically. The information, however, was captivating as it described research that had been done using rats and their stress levels and the effect that stress had on their brains. The information that I was able to synthesize, without having an advanced degree in neuroscience, basically said that rats that were exposed to stressors had an “increased concentration of bax oligomer 270” which from my understanding causes apoptosis, or cell death. This evidence implies that a stressful lifestyle without a form of release for that stress can and does cause cells within the brain to die. It is, however, important to note that these scientists found that a regular exercise routine can stave off apoptosis. As the article states,

Our experimental evidence indicates that regular voluntary exercise can prevent molecular changes that set the stage for cellular apoptosis in the cerebral cortex during chronic stress. Chronic restraint stress increased the concentration of Bax oligomer 270, which is associated with mitochondrial pore-forming activity and the activation of apoptosis (Haack, Luu, Cho, Chen, & Russo-Neustadt, (2008).

Another interesting article focused on the effects exercise has on perceived levels of stress and IL-6 levels in older adults. In order to comprehend the article in full, I had to find out what they meant by IL-6. I was intrigued to find out that IL-6 is an interleukin that is secreted by one’s T cells. IL-6 is very productive at enhancing one’s overall immune system. This helps in the resistance of bacterium and promotes overall well-being. The article expressed that older adults who exercise regularly secrete more IL-6,

thus keeping their bodies functioning properly than to those who do not. The article stated that bodies of adults over the age of sixty generally begin to break down because the T cells do not secrete as much of this vital interleukin. However, with exercise, one can stave off this predetermined state. While the article did not make a direct correlation between one's exercise levels and his mental well-being, it did suggest that the two go hand-in hand. The article states,

Other studies that have evaluated physical activity-immune responses have found that psychosocial factors, in fact, do mediate immunity. For instance, Kohut and colleagues (2005) reported that the enhancement of influenza immunity by exercise was mediated by improvements in depression and sense of coherence among older adults. Kohut's study used a 10-month exercise intervention and found that exercise participants had a greater increase in antibody and IFN production, important measures of vaccine efficacy. They found that the enhancement of IFN was mediated by psychosocial factors (Starkweather, 2007).

The last study at which I looked came from scientists in Australia. They were researching the effects of weight loss on the overall well-being of one's heart, mind, and body. Their results seemed significant and showed positive correlation between a person who had lost weight and the amount of recovery time his body needed following a stressful event. The scientists found that the overall systolic blood pressure of an individual did not necessarily change when compared to others during a stressful situation. What they did discover is the rate of recovery back to a resting systolic blood pressure rate following a stressful event was significantly less in individuals who weighed less. The article states,

We did find that weight loss facilitated a faster recovery of SBP to resting levels after the conclusion of a stressful event because SBP levels were significantly lower in the weight-loss group than in the control group in the first half of the recovery phase (9–18 min after stress). DBP and pulse rate followed the same trend during recovery; however, this was significant only for pulse rate, which was 5% lower in the weight-loss group at the end of recovery. Delayed BP recovery from stress has been associated with higher BP levels after 3 y, and 5 y of follow-up. Further, increased BP during the day, which can result from acute and chronic stresses (repeated incidents of acute stress), is a known risk factor for cardiovascular disease and. In the present study after weight loss, there was a significant decrease in resting SBP, a general decrease in BP throughout the 1-h stress procedure, and SBP reached resting levels 6 min sooner in the 82% of recoveries, all of whom could potentially lower risk from cardiovascular disease by lowering BP levels during the day.” (Torres & Nowson, 2007). This is yet another indication that a healthy lifestyle will promote a healthy and highly functioning body.

Method

With my newly acquired knowledge, I now felt ready to tackle the questions guiding me into my own research. I decided that the best way to get started would be to communicate with my colleagues. As I work in a building with more than thirty teachers, I found time limitations on sitting down to do individual interviews. I, therefore, created a short survey using SurveyMonkey.com that afforded me the opportunity to ask the

questions needed to get at the heart of my research. I did however, reserve the right to go back and personally interview staff members based on their responses.

I asked them a variety of questions that allowed them to reflect on their stress and exercise levels and the effects that these two things have on their overall quality of life. Fortunately, I had thirty people take part in the survey and was pleasantly surprised by how forthright they all were, especially when it came to the written response at the end. I decided that formal follow-up interviews were not needed, but I did have some conversations with several of the teachers who had participated in the survey. Each seemed genuinely happy to speak about his/her experiences regarding the topic.

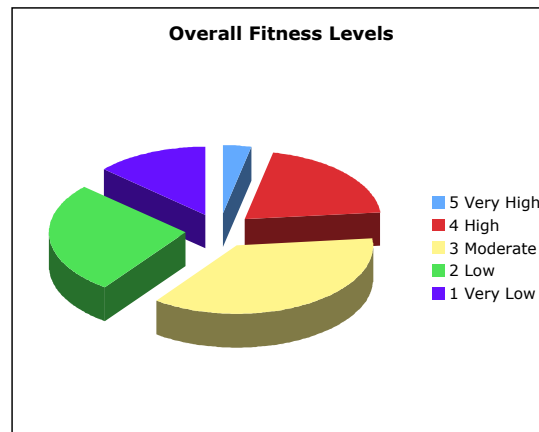
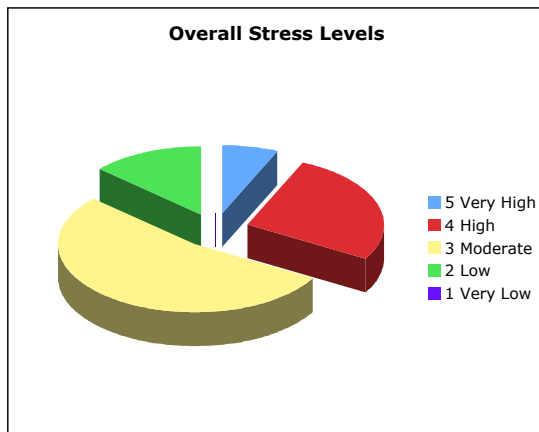
Results

The results shed light on the subject of teacher fitness levels and their perceived levels of stress. I cannot, however, say that a definite correlation exists. To suggest that one directly influences the other would need more testing and research to validate that kind of a conclusion. With that said, I did notice some themes appearing as I looked at the data. It appears that through these answers, the profession of teaching, in general, is a stressful one and that many in the profession turn to exercise to combat the effects of their stress. The following is a summary of responses the thirty participating teachers gave.

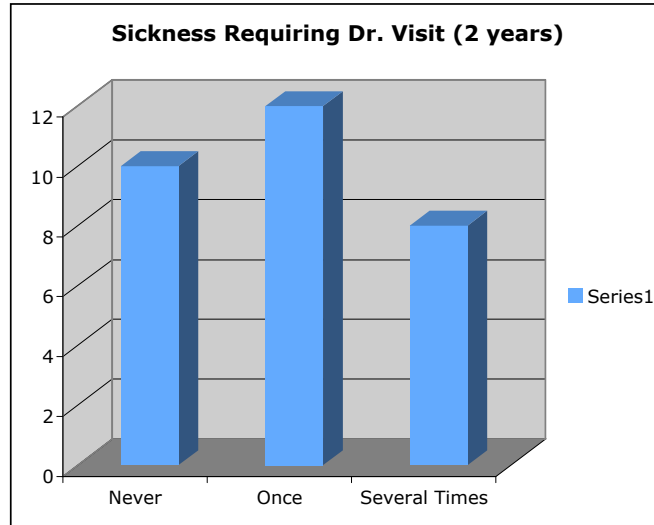
The first and second questions asked involved teachers reflecting on both their perceived levels of stress and their overall fitness levels. Interestingly, the majority of participants, fifty three percent, said they only felt a moderate amount of stress. There was, however, a significant group of nearly twenty seven percent who rated their overall stress levels as high, and in that group, nearly seven percent of the participants said they

have very high stress levels. Conversely, there were zero participants who said they have very low levels of stress, and thirteen percent said they have low levels of stress.

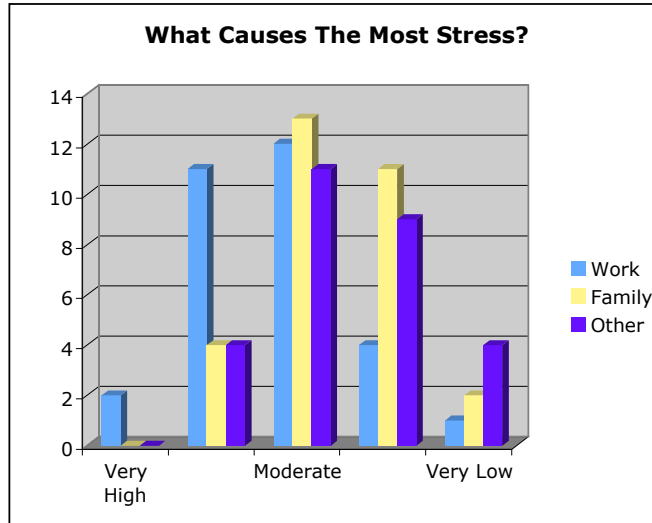
As for the overall fitness levels of the teachers who participated in the study, the majority of respondents again claimed to have moderate levels of fitness. The overall numbers, however, seemed to show some discrepancies. Thirty six percent said they have moderate levels of fitness. Yet, on either side of that number, the percentages were significant. Twenty percent of the participants said they had high fitness levels, with a mere three percent claiming very high fitness levels. Yet, there were twenty seven percent of the respondents who claimed low levels of fitness, and thirteen percent responded in the very low category. Results of these two questions are presented in the following charts.



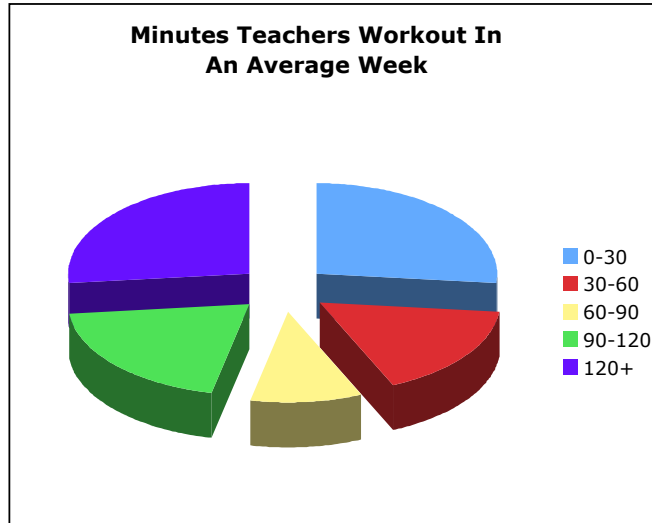
The results of the next question seemed to be more evenly dispersed. Respondents were asked how often they have been very sick (requiring a visit to the doctor) in the past two years. Interestingly, of the thirty responses, twenty said once to several times (twelve and eight respectively). This accounts for nearly sixty eight percent of the group. The results can be seen in the following chart.



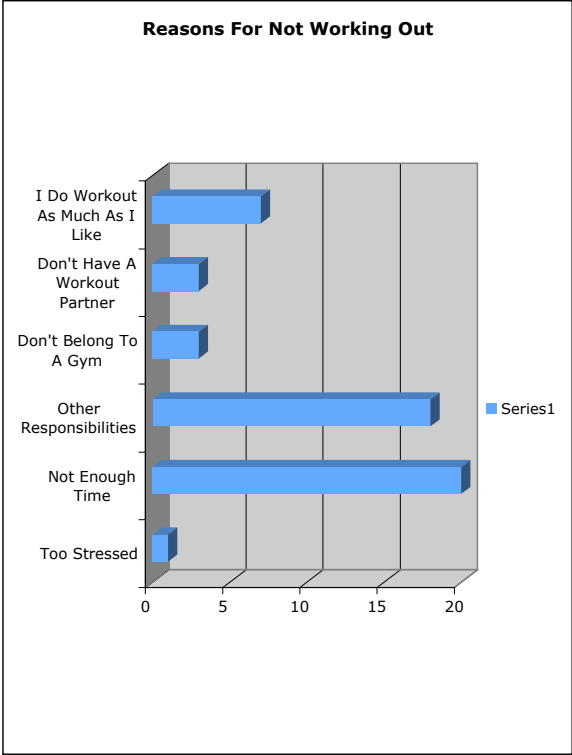
After having asked the previous questions, I was hoping to really dig deeper to find some meaningful theme. The following question in the survey, therefore, asked the participants to rank their level of stress as it relates to their job, their family, or other factors. Interestingly enough, while the majority of respondents listed moderate levels of stress for all three (forty percent, forty three percent, and thirty nine percent respectively), there were some discrepancies among the other variables. Thirty seven percent stated a high level of stress when it came to work, and nearly seven percent stated very high stress levels when it came to work. However, no one claimed very high stress levels in relation to family or other factors. Thirteen percent said their levels of stress were high when it came to family with thirty seven percent saying that family accounted for low levels of stress. Fourteen percent said that other factors increased their levels of stress to high, but conversely, thirty two percent said that other factors accounted for low levels of stress. The evidence high work related stress is presented in the following chart.



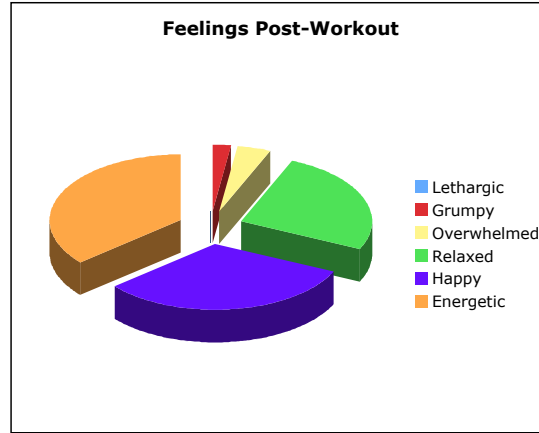
The next question focused on the amount of time one usually works out during an average week. The results of this question are very telling, as there does not appear to be a strong middle ground. Of those surveyed, twenty seven percent said that they work out on average zero to thirty minutes a week. Another twenty seven percent, however, claimed to work out more than one hundred and twenty minutes a week during an average week. The majority of the respondents seem split among the two extremes. Another twenty percent claim to work out between ninety and one hundred and twenty minutes a week. Ten percent claim to work out sixty to ninety minutes a week, and another seventeen percent say they work out between a half hour and an hour during the average week. The following chart is a break down of the responses.



The previous question led nicely to the sixth question of the survey. Participants were asked to give reasons for not working out more often. Given a list of six possible factors, respondents were asked to choose all that applied to their own situation. Resoundingly, the responses came back with sixty seven percent stating that time, and lack of it is an issue for not working out more often, followed closely by other responsibilities, which received sixty percent of the responses. Twenty three percent said they work out as much as they like, while ten percent said they do not belong to a gym and they do not have a work out partner. Only three percent said that they do not work out as much as they would like because they are too stressed to do so. The results of the question are presented in the following chart.



The following two questions seem to complement each other and the results seem to verify a theme. I asked the participants to reflect on their mental and physical status both before working out and after working out and to choose all of the responses that apply them. The results suggest that many of the participants feel overwhelmed (forty five percent), lethargic (thirty eight percent), and grumpy (twenty one percent). This is in stark contrast to how the participants feel after a workout. They responded that post workout; they feel energetic (fifty seven percent), happy (fifty percent), and relaxed (forty percent). A clear breakdown of the responses can be seen in the following charts.



Following these two questions, the participants were asked their opinions about added workouts. In particular, would added workouts decrease your overall stress levels? The respondents signaled a fairly significant yes (sixty percent) to this question with the remaining participants (forty percent) answering no or unsure. The results are presented in the following chart.



While all of the questions and responses in the survey were beneficial to understanding the teachers of the school and their perceived levels of stress and fitness, I feel that the final question sheds the greatest amount of light on the subject. The participants were asked to respond in written format. The question itself was two- fold. The first asked the participants to elaborate on the personal benefits of working out, and

the second asked them if they would be interested in working out with other teachers in the building. The answers were varied... A common theme seems to occur throughout as the teachers express somewhat limited interest in working out with colleagues, but do not deny the importance of working out. The following are the responses received from the participants.

- Working out is a stress reducer. It controls my weight and increases my energy.
- The benefits of working out are that you are relaxed, and you are doing something good for yourself.
- Working out makes me eat better, I feel like I have to feed myself better to match my workouts. Working out keeps me sharper mentally, and working out is one of the few things I do for myself right now. Yes, working out with other teachers would be cool.
- Exercise is good for health and weight loss.
- Exercise increases my fitness level and gives me more energy to tackle every day tasks.
- Exercise helps me manage my stress, emotions, and weight. It makes me feel stronger inside and out.
- Exercise improves my health and makes me feel better.
- Exercise is good for stress reduction, positive body image, and health. I would be interested in working out with other teachers.
- Exercise gives me more energy and helps me be healthier...hopefully!
- Exercise gives me a feeling of well being.

- Working out gives me more energy, I eat less, sleep better, and overall feel better. I did Jazzercise at my previous school with teachers and had a blast, and it was convenient to have it in our gym.
- Working out makes me feel less stressed; I have more energy, and it gets me into better shape.
- I would enjoy working out with others IF it were conducive to my family schedule. I feel more relaxed after my workout on the bike...I feel that I have accomplished my goal and look forward to my next session to push myself harder. I forget my worries while I am pedaling because I am focused on getting the most out of each workout. At the end of the day, I feel that I have EARNED a good night's sleep. I also sleep better when I consistently workout!
- The best benefit for me would be for me to get off all of my medications. If there were a group of teachers getting together, it may help me get motivated.
- Working out is health for the heart and muscles. It is a great way to maintain physical fitness and decrease the aging process.
- I'd love to walk during our lunch breaks, but it always seems too busy or things come up that prevent us from doing it.
- I have lost eighty pounds and as a result my energy and stamina have increased. I have less joint pain and just feel so much better. The time it takes to put in a workout does cause a little stress, however. It takes so much time.
- Working out gives better health, more energy, and weight loss. Yes, I would like to workout with other teachers.

- Working out helps me lose weight and be more energetic. I would absolutely be interested in working out with other teachers.
- Absolutely!
- Sure!
- Working out calms the mind, creates higher self-esteem, and makes the body full of energy. It can only help you live longer as well!
- As tired as I am after a long day it always makes me feel better when I work out. It is a great release. As for working out with other teachers, it would depend on the activity, but I already do with some. It does make it more fun!
- Personal benefits of working out are healthier body, increased life longevity, increased self-esteem, and stress reliever. I would not like to work out with other teachers.
- Working out definitely calms me. It reduces stress and makes me feel so much better overall. I am not sure if working out with other teachers would work for me because I have to “steal” the time to work out at different hours whenever it fits for my family and me.
- I started exercising daily to reduce my stress (which was very high at the end of 2008). Daily exercising helps with fitness and stress reduction. I would not be interested in working out with other teachers.

Discussion

In order to find a direct correlation between fitness levels, stress, and health problems among my colleagues, more research is needed. The research that was conducted, however, did offer an opportunity for me to discover the effects of physical

activity on one's overall well-being and to tie it more directly to the people with whom I work. The results show a staff of savvy and knowledgeable individuals who understand the importance of balance. Whether it is balance obtained through physical activity, meditation, or some other form, this balance seems to be the key to maintaining healthy levels of perceived stress.

This study focused on the importance of working out and the effects it has on teachers. To reiterate, maintaining a regimented, vigorous, and scheduled workout has proven very beneficial in my life. I set out to see if other teachers were doing the same, and if so, were they finding similar results. I think it is safe to assume from this study that many do feel the same way, but to assume that everyone could and would benefit from working out is unfair. Everyone has a different set of circumstances and coping mechanisms that help them maneuver through their daily lives. Yet, the study does show that there are a significant number of people in my workplace who understand the importance and value a workout routine may have on their lives. Several participants indicated interest in working out with other teachers. Such a program, however, would come with limitations as we use the cafeteria and the gym to house many of our before and after care students. If we could manage the space and equipment needed, a program could be introduced to the small population of individuals who want it. Depending on its overall success, the staff could then decide if this is something that should be continued or terminated.

Whatever the staff might decide, I appreciate those who participated in the study, and hope that my findings are helpful if a program is adopted and implemented for the teachers of our school.

Bibliography

- Rimmele, U., Seiler, R., Marti, B., Wirtz, P.H., Ehlert, U., & Heinrichs, M. (2009). The level of physical activity affects adrenal and cardiovascular reactivity to psychosocial stress. *34*, 190-198.
- Tveito, T.H., & Eriksen, H.R. (2008). Integrated health programme: a workplace randomized controlled trial. *Journal of Advanced Nursing*. *65*, 110-119.
- Gerber, M., & Puhse, U. (2008). “Don't crack under pressure!”—Do leisure time physical activity and self-esteem moderate the relationship between school-based stress and psychosomatic complaints?. *Journal of Psychosomatic Research*. *65*, 363-369.
- Haack, D., Luu, H., Cho, J., Chen, M.J., & Russo-Neustadt, A. (2008). Exercise reverses chronic stress-induced Bax oligomer formation in the cerebral cortex. *Neuroscience Letters*. *438*, 290-294.
- Starkweather, A.R. (2007). The Effects of Exercise on Perceived Stress and IL-6 Levels Among Older Adults. *Biological Research for Nursing*. *8*, 186-195.
- Torres, S.J., & Nowson, C.A. (2007). Effect of a weight-loss program on mental stress–induced cardiovascular responses and recovery . *Nutrition*. *23*, 521-528.