Police officer fitness, diet, lifestyle and its relationship to duty performance and injury

James E. Guffey
National University

James G. Larson
National University

James Lasley
California State University, Fullerton

ABSTRACT

The United States military expects a certain level of fitness from their soldiers, sailors, airmen, and marines. To insure a level of expected fitness, the U.S. military plans regular exercise into most work days. Some civilian occupations also expect their employees to be fit, but they primarily rely tacitly on the self-motivation of the individual employees to do this. Police officers and firefighters are examples. This paper examines the relationship among police officer fitness, diet, and lifestyle and its impact on duty performance and injury to determine if tacit reliance on individual officers is sufficient.

Keywords: police officers, fitness, diet, lifestyle, performance, injury

INTRODUCTION

Rationale for the Study

It would seem self-evident that an occupation such as policing would demand that police officers stay fit as a part of the job requirements. Police officers are engaged in physical challenges on a regular basis. For example, they chase fleeing suspects; they climb over fences and onto roof tops; they subdue resisting arrestees; and they lift heavy objects such as recovered stolen property. These often daily job requirements require strength and endurance that is obtained by a combination of aerobic and anaerobic exercise. Adding to this physical challenge is the fact that officers must carry bulky items of additional weight on a pistol belt: handgun, baton, mace, handcuffs, and Taser. Therefore, it would seem appropriate that police and sheriff departments would emphasize fitness by providing gym memberships to officers as an incentive, or that police officers would be self-motivated and place emphasis on fitness and reserve off-duty time to maintain fitness. Fitness/wellness of police officers has been the focus on many studies; nevertheless, the authors felt it needed attention once again. Fitness is an important and vital factor for the success of policing, and this paper looks at a sample of police officers to see the results.

LITERATURE REVIEW

Introduction

The literature on police officer fitness is significant so the authors have identified specific areas to cover so that the reader has understanding of the issues involved in police officer fitness and wellness. These topic areas are (a) selected examples of both international and United States efforts toward fitness, (b) police union resistance, (c) termination of police officers, and (d) comparative studies.

Selected Examples of Police Fitness Efforts Internationally

Policing is an important function of local and national governments throughout the world. All nations strive to provide their citizens with the most effective policing within the constraints of budgets and legal mandates. Police officer fitness has been an issue for police departments as far back as the Sir Robert Peel's Bobbies and the London Metropolitan Police Department which was established in 1829 by a Parliamentary act (Summerscale, 2008). **(CITE)**

Police officer fitness is not restricted to United States police departments. "Senior Superintendent Lindela Mashigo of the Pretoria, South Africa Police Department recently started running, inspired by his police commissioner, Bheki Cele, who he describes as a "fitness fanatic." Cele launched the SA Police Service (SAPS) fitness and wellness programme, which hopes to encourage the country's tubby police officers to fight the flab by keeping physically fit through exercise and by following a healthy diet" (Bega, 2010, p. 4).

Superintendent Brett Pointing of the Queensland, Australia Police Department boasts of his completion of the FBI National Academy's Yellow Brick Road—a notoriously difficult US Marine Corp obstacle course that is considered one of the toughest in existence. "The higher level of fitness helps the police executive cope with their workload, and we learned about

nutrition, diet and the metabolism,"(Wilson, 2005, p.48) said a leaner police officer who has now become a 10 km runner and will compete in this year's Gold Coast Marathon.

The London Metropolitan Police, the oldest police department in the world, has become exceptionally tough on unhealthy police officers. Fat or unhealthy police officers could be forced to resign. One idea is to have officers take a fitness test every 3 years. If they fail, they would be placed on unpaid administrative leave until they increase fitness levels and pass the fitness test and change their lifestyle. If there were still no sign of improvement, they could be forced to resign. "Figures released by the London Metropolitan Police Department in early 2003 show that the London Metropolitan Police take nearly twice the number of sick days as the average City of London private sector worker. This results in nearly 1.5 million police working days being lost annually" (Taylor, 2003, p. 34).

In Ontario Province, Canada, all police officers must meet annual fitness standards. Owen Sound City police constable, Brian Dunham, stated, "You don't have to be a runner to be a police officer, but if you're not in fairly good shape you run a real risk of hurting yourself and maybe having a heart attack" (Algie, 2001, p. A3).

The National Police of one Asian country set up a six-month fitness campaign for its 113,000 members. "The most notable feature of the campaign was to reduce the waistline of police officers to a maximum of 36 inches. Twice per week the officers were required to do aerobic exercises, timed jogs, push-ups and pull-ups. There were regular command-sponsored mass exercises and ballroom dancing" (Siruno, 2009, p. 54).

Selected Examples of Police Fitness Efforts in the United States

Dr. Kota Reddy, a cardiologist in Houston, Texas, offers free cardiac screenings to police officers in the Sugar Land and Missouri City public safety departments. An interventional cardiologist, Reddy has long been aware that heart disease is rampant in public safety occupations. "Stress, poor diets and work environments that mix sedentary hours with sudden intense physical activity make police officers significantly more vulnerable. He cites studies that show heart disease causes 45 percent of on-duty firefighter deaths and 22 percent of police officer deaths" (Hastings, 2008, p. 9).

Quire and Blount's 1990 study of 380 sworn police officers of the St. Petersburg, Florida Police Department found that older officers were at greater risk of coronary heart disease than younger officers. Nevertheless, based on Center for Disease Control standards, St. Petersburg police officers were at very low risk levels and had significantly reduced their risk level over a period of 5 years from 1981-1985. This reduction was attributed to a concentrated effort on the part of the department, and in particular complete physical examinations, that contained the cholesterol screen and the resultant discussion of risk profiles, and a fitness program that contained exercise and diet recommendations.

Diet and exercise must go together. The combination maximizes the level of fitness and stored energy in one's body. Mark Farmer is a Lieutenant with the Aiken, South Carolina Public Safety Department. He is also a certified physical fitness coordinator through the Federal Law Enforcement Training Center (FLETC). Farmer discusses the need for police officers to stay in shape by engaging in regular exercises and maintaining a balanced nutrition and diet by having the right amounts of proteins, carbohydrates, and fats. "Physical exercise and diet must be done together. Think of it as a positive and negative on a battery. If one end is not connected, you have no power." (Farmer, 2004, p. 34). He states there are a total of 25 amino acids which, when

put together in different combinations, make different kinds of protein that you need to form your cells and organs. Eight of these amino acids are called essential—and from these your body can make the remaining 17. These proteins can be found in chicken, tuna, black beans, fish, and red meat. He admonishes against frying! Frying not only takes away a large amount of the good stuff, but it also adds saturated fat" (Farmer, p. 35).

Saturated fat is to be avoided as much as possible in one's diet. According to the Centers for Disease Control, "diets high in saturated fat have been linked to chronic disease, specifically, coronary heart disease. The Dietary Guidelines for Americans 2010 recommend consuming less than 10% of daily calories as saturated fat. In general, saturated fat can be found in the following foods: high-fat cheeses, high-fat cuts of meat, whole-fat milk and cream, butter, ice cream and ice cream products, and palm and coconut oils." (Centers for Disease Control, p. 1)

Litigation, Termination of Police Officers, and Police Union Resistance

The legality of terminating police officers based on departmental fitness standards hinges on the court's interpretation of Title VII of the Civil Rights Act of 1964. Title VII prohibits employment discrimination based on race, color, religion, sex and national origin**.** With regard to fitness standards, one issue of concern has been holding female officers to the same standard as male officers. In the case of *Lanning v. Southeastern Pennsylvania Transportation Authority* 1998 WL 341605 (E.D.Pa., 1998), the U.S. District Court for the Eastern District of Pennsylvania handed down a decision in 1998.

In 1991, as a part of an effort to upgrade its 234 officer police force, the Southeastern Pennsylvania Transportation Authority (SEPTA) which operates a commuter rail system in Philadelphia and its suburbs, instituted a series of physical fitness requirements for both on-board and potential police officers. Among these was a requirement that applicants complete a 1.5 mile run in 12 minutes. Failure to meet this standard disqualified an applicant from employment as a police officer (Brooks, 2012, p.28).

In 1997, five women brought suit against SEPTA because they had failed to meet the above standard. The U.S. District Court for the Eastern District of Pennsylvania found in favor of SEPTA because SEPTA was able to show that a certain aerobic capacity was necessary for the job of SEPTA police officer. SEPTA provided data wherein police officers had been unable to capture suspects in short pursuits, and this had led to escapes by felons thus endangering the public.

In 2007, a Bellevue, Washington police officer was fired for violating a part of a department policy that requires officers to maintain a high level of physical conditioning through regular exercise and proper diet. Chris Parent, 51, fought for his job in a civil service commission hearing. Parent was fired on November 28, 2007 for violating a policy that reads; "Police officers are called upon to perform a variety of tasks that require physical endurance and agility. This dictates that officers maintain a high level of physical, mental and emotional condition, which can only be acquired through regular exercise, proper diet and utilizing time" (Palmer and Kuiper, 2008, p.2).

More recently, three Suquamish, Washington police officers were fired in April, 2011 following the department's high-stakes fitness program. The department's officers are expected to pass a yearly fitness test of push-ups, sit-ups, a 300-meter dash, and a 1.5 mile run—the later two are timed events (Farley, 2011).

Police unions have generally resisted attempts by police and city administrators to implement physical fitness written policies and physical fitness tests for sworn police officers.

The unions' efforts have generally been successful in larger departments with strong police unions. The future of union resistance is uncertain as it will most likely depend of the direct of litigation—particularly by the United States Supreme Court which has so far refused to hear cases on this issue.

Comparative Studies

The following are five studies which are similar to the authors' study.

Study #1. The most comprehensive 20th Century study of police officer fitness was conducted by the Cooper Institute for Aerobics Research (CIAR) between 1983 and 1993 that randomly sampled approximately 1,700 officers from different law enforcement agencies across the country (Quigley, 2008). This study found that officers' average fitness levels were below normal in the areas of aerobic fitness, body fat, and abdominal strength. Fitness levels were average in upper body strength and low back flexibility. Overall fitness of law enforcement officers in most areas of the US was less than that of 50 percent of Americans during this time period (Quigley).

As a result of the Cooper Institute for Aerobics Research work, police officers can apply to attend the Law Enforcement Fitness Specialist Course. This is a 4.5 day course designed specifically for the law enforcement and public safety professional who is involved in developing and delivering physical fitness programs (The Cooper Institute, 2001).

Study #2. G. Gregory Tooker and David Cashwell (2007) of the Commission on Accreditation of Law Enforcement Agencies (CALEA) completed a pilot study begun by Tooker and Smith (2005) on behalf of the National League of Cities local government self-insurance organizations. The authors and CALEA sought participation in their study from several states; however, only the State of North Carolina participated. The pilot study was conducted in seven North Carolina agencies and subsequently funding was provided for the statewide study in 2005. Despite the lack of participation on a larger scale, the findings were encouraging. Several participants were able to stop taking medication for hypertension and diabetes because of weight reduction they achieved; two officers stopped smoking; and significant run time and overall body strength improvements were recorded (p. 1).

Study #3. Bullock (2007) examined worker compensation claims of police officers covered by the Virginia Municipal Group Self Insurance Association (VMGSIA). He sought to determine what activities are causing the most frequent and severe injuries to police officers. Most notable among Bullock's findings is that "there is a strong correlation between an officer's fitness/health level and his/her performance at an ideal level both on and off the streets." (p. 1).

Bullock also noted that "police officers live two to five years post-retirement on average. This can be attributed to a lack of personal and agency fitness and wellness programs." (p. 1).

Study #4. Nabeel, Baker, McGrail and Flottemesh (2007) explored the correlation between physical activity, fitness, and injury by surveying a cross section of police officers in the Minneapolis Police Department. Specifically officers were asked about their level of fitness, physical activity, and prevalence of injury and chronic pain within a year of the study period. The authors found that officers with the highest self-reported fitness levels were less likely to experience sprains, back pain, and chronic pain than those who considered themselves less fit.

Study #5. Boyce and Hiatt (1992) conducted a case study of a fitness/wellness program in a large metropolitan police department in the Southeastern United States. At the time of their study, this department had an exemplary 11-year old fitness/wellness program and thus the choice of this city for their study.

Recruits were given fitness classes that were structured to help improve the student's cardiovascular endurance, flexibility, muscular strength, muscular endurance, and body composition. These classes met 3-5 times per week. When officers graduated from the police academy and entered their 52-week field probationary period, the structured fitness sessions ended, but officers were encouraged to continue a fitness program of their own choosing. The incentive to continue was the use of annual (under 45 years) and bi-annual (45+) medical exam results in promotion, reclassification, reassignment, and granted education leave (Boyce & Hiatt, 1992).

The findings were not encouraging for unsupervised, unstructured, voluntary fitness sessions by individual officers. Recruits showed reductions in 1.5 mile run times throughout the academy; however, these times increased significantly between graduation from the academy and the end of the probationary period. The same was true for flexibility (sit and reach test), endurance (sit-ups), and strength (bench press); all decreased. Finally, and particularly significant, body fat decreased during the police academy period but increased during the 52-week probation and continued to increase when measured at 3 years of employment (Boyce & Hiatt).

Research Hypotheses

There are three hypotheses being tested in this study. Hypothesis #1: There is a correlation between aerobic and anaerobic exercise and the incidence of on-duty injury among police officers. Hypothesis #2: There is a correlation between diet and on-duty injury. Hypothesis #3: There is a correlation between aerobic and anaerobic exercise and the number of injury days off + sick days taken over a 5-year period.

Prior to setting out on this project, the authors reviewed the literature on police officer fitness/wellness as we were interested in this topic as was the California Commission on Peace Officers' Standards and Training (California POST). There had not been any significant studies of this topic either in California or the United States since the CALEA study identified above (Study #2). We felt it was an important area to address again, if for no other reason, to give this issue visibility once again.

METHODOLOGY

The data obtained for this study were received through a questionnaire. The questionnaire was designed to obtain data about officer fitness, diet, and lifestyle and the number of on-duty injuries, injury leave, and sick leave taken over a 5-year period. The questionnaires were distributed in June, 2011 and all questionnaires were received by September 2011. The questionnaires asked the officers to go back in time 5 years from the date of the receipt of the questionnaire (on/about June 2006) and fill out the questionnaire based on these 5 years (June, 2006-June, 2011). The limitations to this questionnaire method are that it relied on the officers' memories of this period, and the data are all self-report with the attendant issues with self-report data that is not cross-validated. Data were gathered on the following variables:

1. Gender
2. Age
3. Years of Law Enforcement Experience
4. Ethnicity

5. Education
6. Height
7. Weight
8. Body fat
9. Shift most often worked
10. Diet
11. Lifestyle
12. Cigarette smoker or not
13. Times injured over a 5-year period
14. Injury seriousness (**minor**: 2 days or less injury leave; **substantial**: 1 week injury leave; and **serious**: more than 1 week injury leave)
15. Injury leave over a 5 year period
16. Sick leave over a 5 year period
17. Weekly hours of aerobic and anaerobic exercise

Critical Independent and Dependent Variables

The critical independent and dependent variables are defined as those that are the focus of the three hypotheses identified above.

Independent Variables:

1. Aerobic and/or Anaerobic Exercise of 5+ hours per week
2. Strict Diet (Defined as consumption of 2,500 calories per day for males and 2.200 calories per day for females).

Dependent Variables:

1. Times injured over the previous 5-year period
2. Injury leave over the previous 5-year period
3. Sick leave over the previous 5-year period
4. Injury seriousness over the previous 5-year period
5. Weight

The questionnaire was handed out to full-time, sworn police officers working in the patrol division during roll-call at eight police departments. Seven of these departments were located in California; the eighth department was the Houston, Texas Police Department. The seven California departments were chosen because the authors had internal contacts that made access to these departments assured. These seven departments were the Sacramento Police Department, the Sacramento Sheriff Department, the Los Angeles Police Department, the San Diego Police Department, the San Diego Sheriff Department, the Chula Vista Police Department, and the National City Police Department. The questionnaire was also mailed to several departments outside of California, but the only non-California department that agreed to participate was the Houston, Texas Police Department. The questionnaire was distributed by an internal police representative in all eight departments who asked the patrol officers to participate only if they wanted to participate. Participating officers were read instructions which included that the officers should not identify themselves in any manner on the questionnaire. A total of 217 completed questionnaires were returned as indicated in Table 1 (Appendix A).

FINDINGS/RESULTS

Sample

One hundred seventy-three male officers participated in the study (79.7%), and 44 female officers (20.3%). The ethnic breakdown was 137 White officers (63.1%), 16 Black officers (7.4%), 36 Hispanic officers (16.6%), 12 Asian officers (5.5%), and 16 officers who identified themselves as "Other" (7.4%).

Table 2 as indicated in Table 2 (Appendix A) demonstrates that the sample of 217 officers was very well educated. The mean years of education was almost 15 which is just 1 year less than a 4-year college degree. The range of education was from high school graduate to post-graduate studies beyond a master's degree. The sample of 217 officers was clearly what one would consider to be seasoned officers. The mean was 14.23 years, and the range was 5 years to 32 years experience.

The mean height of the male officers was 5'10.1 inches and the mean weight of the male officers was 202.66 pounds. The mean height of the female officers was 5'5.3 inches and the mean weight of the female officers was 139.5 pounds. According to the Center for Disease Control's National Center for Health Statistics, the mean height of adult male Americans is 5'9.5 inches and the mean weight of adult males is 191 pounds. The mean height of adult females is 5'4" and the mean weight of adult females is 164.3 pounds. The conclusion to be drawn from these data is that the male officers slightly exceeded the national averages in both height and weight; whereas, the female officers exceeded the height averages, but were well below the national female weight average.

The combined mean number of hours per week for both aerobic and anaerobic exercise for all 217 officers was 4.6 hours. This includes the officers who indicated they worked out fewer than a combined 5 hours per week and the officers who indicated they did not work out. The range of combined work out hours was 0 to 16 hours per week.

Table 3 as indicated in Table 3 (Appendix A) shows the percentage of responding officers who indicated they spent 5 or more hours per week participating in aerobic, anaerobic, or a combination of both, were injured on duty, maintained a strict caloric diet (defined as 2500 calories per day for males and 2200 calories per day for females), and whose agency provided a paid fitness center membership.

Table 3 shows that slightly more than 50% of the officers maintained a fitness program of 5+ hours per week. About one-third were injured on duty. Slightly over one-quarter adhered to a strict diet as defined by the American Medical Association and 41% of surveyed officers indicated that their agency provided them with a paid fitness center membership or gave them on-duty time to conduct a fitness program. In addition, over the last 5 years, the mean number of days lost from work of the 71 officers who indicated they had been injured in the line of duty was 10.159 days.

The Bureau of Labor Statistics (2009) compiled data on "sick leave usage by major industry groups." The major industry categories are (1) financial activities, (2) information industry, (3) trade, transportation, and utilities, (4) professional and business services, (5) the leisure and hospitality industry, and (6) the construction industry. Data from 2009 indicate that industries 1-4 took an average of 4 days sick leave per year, but industries 6 and 7 took only an average of 2 days per year. Comparing these data with our study sample (10.159 days over 5

years) indicates that the officers were on the lower end of the sick/injury leave days taken among national industries.

Table 4 as indicated in Table 4 (Appendix A) is quite interesting because it is counter-intuitive to the data. It indicates that over 95% of the 217 surveyed officers felt that fitness was either extremely or very important. Thus, even many of the officers who indicated that they did not work out responded that being fit was either extremely important or very important. This may indicate that some officers would engage in a regular fitness program if they were given an incentive such as a paid fitness center membership or on-duty wellness time.

An example of on-duty wellness or fitness time would be a patrol squad of 8-10 police officers being led by the patrol supervisor on a 1-2 mile jog/run prior to their actual duty shift. This could be accomplished in less than 1 hour, and the squad could be on their regular patrol duties after 1 hour. This 1-hour could be covered by command officers (lieutenants and captains, for example) who do not have regular respond-to-call responsibilities. Different squads would participate each day of the week on a rotational basis so that each squad on the shift participated at least once each week. This wellness program would accomplish at least 2 objectives: (a) squad members would get at least 1-hour-per-week of aerobic exercise, and (b) the squad would participate in an event that could create esprit de corps among the squad and encourage squad members to continue their wellness program off-duty. Competition could be encouraged among squads for the least total time for the 1-2 mile run for an entire squad.

SPSS Correlation Results

The data from the 217 questionnaires were tabulated onto spreadsheets for the ***critical variables*** listed earlier in the Methods section. These data were entered into SPSS version 12 for linear regression and Pearson Correlation Coefficient 1-tailed.

Table 5 as indicated in Table 5 (Appendix A) shows that for the identified critical variables, the linear regression standardized coefficients indicated that significance at the .01 level is achieved only for aerobic exercise and weight and aerobic exercise and education. Because weight is closely related to diet, linear regression was also determined for weight as an independent variable and injured as a dependent variable.

The data in Table 6 as indicated in Table 6 (Appendix A) indicates significance at the .05 level between weight and injured. Comparing the significance of aerobic exercise and weight in Table 5 ($p=.011$) and weight and injured in Table 6 ($p=.05$), there is an indirect correlation of aerobic exercise with injury (aerobic exercise is related to weight and weight is related to injury).

Pearson R correlations were also determined for selected variables. Table 7 as indicated in Table 7 (Appendix A) shows the results of the correlations of selected variables. The data in Table 7 adds significantly to the findings in our study and presents findings that were not sought in the four hypotheses. Table 7 indicates that Age and Years of Law Enforcement are highly significant ($p=$ or $<.01$) for 5 variables—Weight, Aerobic and Anaerobic Exercise, Injured, and Sick Leave.

Older officers and officers with more time on the job having more injuries are obviously related. Although experience may be an important factor in officer efficiency on the job, it does not appear to be a positive factor for injury and time lost as a result of injury leave time. Older and more experienced officers appear to be more prone to injury and thus time lost due to injury leave. This comports with weight in that heavier officers have more injuries than slimmer

officers. As officers age, they become more overweight and more susceptible to injury which may result in more injury leave time. An interesting finding and trend was that officers who were injured on duty initially took injury leave but subsequently took more sick leave. This may indicate that injuries may reoccur and, when they do, officers may be taking sick leave to allow healing to take place again. The authors want to emphasize that the foregoing discussion is not an "assault" on older officers. On the contrary, it is meant only to direct attention to the need to give more emphasis and resources toward fitness and diet for officer over the age of 50, for example.

Diet

According to the *Dietary Guidelines for Americans, 2010*, a healthy eating plan:

- Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products
- Includes lean meats, poultry, fish, beans, eggs, and nuts
- Is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars
- Stays within your daily calorie needs

Only 26.3% of the surveyed officers indicated that they maintained a strict diet of 2,500 calories per day for males and 2,200 calories per day for women. Clearly, some of the officers who indicated that they worked out regularly did not maintain a strict diet. What might be the explanation for officers who work out regularly not maintaining a strict diet? Having been police officers, the authors know how difficult it is for officers to take time to relax and enjoy a well-balanced meal while on duty. Too often meals are "fast-food" meals that have too much saturated fat and calories and not enough nutrition. Another possibility may be that officers who are working out regularly feel that exercise is sufficient to keep them fit and eventually they will burn sufficient calories to reduce their body fat. Whatever the reasons, this will be a point of discussion in the conclusions and recommendations section.

For the variable cigarettes (cigarette smoking), which is considered another negative health factor, 216 officers responded to this question and only 10 indicated that they smoked cigarettes—4.6%. This is considerably less than the 21% of all Americans over the age of 18 who smoke cigarettes, according to the Centers for Disease Control (Centers for Disease Control, 2012). This is positive sign for health and wellness among police officers.

Limitations of the Study

Ideally this study would have surveyed more officers in more police departments in the United States and globally. However, time and resources limited the sample to departments within California where the authors had access to departments that were willing to participate and to the Houston, Texas Police Department, which was the only city outside of California which participated even though 9 other cities were asked to participate. By doing so, the Houston Police Department contributed to the external validity of this study. Even with the limitations, the authors believe that this study has both internal and external validity.

Recommendations for Further Research

Future research should include more departments both in the United States and globally. Ideally 500 or more surveys should be obtained. The best approach for future research would be a multiple interrupted time-series design conducted longitudinally over several years with two experimental groups: one a cohort of police officers who are actively involved in fitness; a second cohort of, for example, construction workers who are actively involved in fitness, and two control groups in each occupation of sedentary officers and construction workers. A questionnaire similar to the authors' could be given at the beginning, middle and end of the longitudinal period. This could be done simultaneously in the U.S., Europe, Asia, and Africa, for example. The obviously limitation to this study would be the cost.

RECOMMENDATIONS AND CONCLUSIONS

Recommendations

Even though the data did not support two of the three hypotheses, the finding that three-quarters of the officers were not adhering to a strict diet and that being overweight contributed to more injuries and time lost points to an issue that should be addressed more in police agencies. In the Literature Review (see p. 7, para. 1, "A study of 380…), the authors cited the St. Petersburg, Florida Police Department and their significant reduction of officer risk levels over a 5-year period through a combination of exercise and diet. Our study places emphasis again on this important combination of exercise and diet. As noted earlier, it is difficult for officers to maintain a healthy diet when working in the patrol division 24/7. However, officers generally eat only one meal while on duty. Officers should be encouraged to eat a healthy meal just prior to going on their shift and to maintain this diet as described above (*Dietary Guidelines for Americans, 2010*) when off duty. Police and sheriff departments should contract with nutritionists to plan healthy diets in conjunction with exercise for every officer on the department. Officers should monitor their daily caloric intake just as they might keep track of their exercise type and duration. Dietitians and fitness trainers can be police officer's best friends off-duty, but departments must be willing to budget for these.

If budgetary constraints prevent hiring dietitians and fitness trainers, there are other alternatives to at least make police officers aware of the importance of proper diet and exercise. One option is to have at least one required in-service training session per year devoted to a presentation of nutrition. This could be done very inexpensively by showing a training film on preparing healthy meals at home; choosing low calorie/low cholesterol foods when eating during one's shift; and urging supervisors and command officers to set the example by also eating healthy and maintaining their weight in proportion to height and weight. The same can be done with a training film featuring a skilled trainer who demonstrates how officers can maintain an excellent level of fitness in no more than 5-6 hours per week.

Other recommendations are for departments to budget for private gymnasium memberships for officers or build fitness stations within an area of the police department. This is supported by the data in Table 4 in which almost 96% of the surveyed officers felt that fitness was either extremely or very important; however, only 53.45% actually engaged in a regular fitness program. Perhaps a significant number of the remaining 42% would become actively engaged in fitness, if there were more incentive. Finally, departments can offer incentives, such

as additional vacation days, for officers who pass a rigorous wellness test. Less emphasis should be placed on sanctions, such as policies that allow the firing of unfit officers who struggle to or cannot perform essential duties required of policing. Nevertheless, firing officers should not be ruled out, rather it should be a last resort when other measures, such as refusal to participate in a wellness program when offered as an alternative to firing.

Finally, unfit officers who use excessive force to compensate for their inability to use simple, physical restraining methods, such as "empty-hand submission techniques" (any use of force to subdue a resisting arrestee that does not involve a weapon such as a baton, mace, taser, or firearm, for example), or who cause other officers to be injured because they cannot render adequate assistance may potentially be exposed to legal liability for resulting injuries. Vicarious liability can also extend to the officer's agency. Therefore, fitness and wellness are just as important as any other required, documented training that agencies are required to conduct in order to blunt potential and costly law suits resulting from use of excessive force.

CONCLUSIONS

Research Hypotheses

For hypothesis 1, although there were no data to support a direct correlation between an aerobic and/or anaerobic fitness regimen of 5+ hours per week and a reduction of on-duty injuries, there was *indirect* support for this hypothesis. There was a correlation between aerobic exercise and weight (p=.011, see Table 5). The more aerobic exercise an officer engaged in, the less he or she weighed. Overweight officers were more likely to be injured than officers who were not overweight, and both aerobic and anaerobic exercise can significantly reduce weight when combined with a balanced diet of 2,500 calories per day for active males and 2,200 for active females.

For hypothesis 2, there is also *indirect* data to support a correlation between diet and injury. There was a correlation between injury and weight (p=.023, Table 6). Heavier officers incurred more injuries than officers whose weight was in balance with height and age. . For hypothesis 3, there were no data to support a correlation between an aerobic and/or anaerobic fitness program and fewer hours of time lost (injury leave + sick leave) from duty.

REFERENCES

Algie, J. (2001, Mar 2). And the beat goes on…. *Sun Times*, Owen Sound, Ontario, Canada, p. A3. Retrieved on August 22, 2011, from ProQuest database, DOI 303088681.

Bega, S. (2010, March 27). Cops must fight fat as well as crime. *Pretoria, South Africa News*, p. 4. Retrieved on August 22, 2011, from ProQuest database, DOI 1995298021.

Boyce, R.W., & Hiatt, A.R. (1992, Summer). Physical fitness of police officers as they progress from supervised recruit to unsupervised police officer. *Wellness Perspectives, 8*(4), 31-43. Retrieved on January 25, 2012, from EBSCOhost

Brooks, M.E. (2001, May). Law enforcement physical fitness standards and title VII. *FBI Law Enforcement Bulletin, 70*(5), pp. 26-32.

Bullock, T. (2007, Summer). Police officer injury study. *VML Insurance Program Law Enforcement Newsletter, 1*(2), p. 1-4. Retrieved on October 24, 2012, from https://www.vmlins.org/Newsletters/Law/injury.htm

Centers for Disease Control and Prevention. (2012, October 4). *Nutrition for everyone: Saturated fat*. Retrieved on October 18, 2012, from http://www.cdc.gov/nutrition/everyone/basics/fat/saturatedfat.html.

Centers for Disease Control and Prevention. (2011, September 6). *Adult smoking in the United States* Retrieved on October 19, 2012, from http://www.cdc.gov/vitalsigns/adultsmoking/?s_cid=vitalsigns-087-bb.

Farley, J. (2011, May 5). Suquamish police officers fired after department revamps fitness policy, *Kitsap Sun Newspaper Online*. Retrieved on October 30, 2012, from http://www.kitsapsun.com/news/2011/may/05/suquamish-police-officers-fired-after-department/

Farmer, M. (2004, June). Fit at 40. *Law & Order, 52*(6), p. 34-39. Retrieved on August 22, 2011, from ProQuest database, DOI 657578331.

Hastings, K. (2008, February 7). Local cardiologist offering heartfelt support to sugar land and missouri city public safety officers. *Houston Chronicle*, p. 9. Retrieved on August 22, 2011, from ProQuest database, DOI 1428774171.

Nabeel, I, Baker, B.A., McGrail, M.P., & Flottemesch, T.J. (2007, September). Correlation between physical activity, fitness, and musculoskeletal injuries in police officers. *Minnesota Medicine, 90*(9), 40-43. Retrieved on January 25, 2012, from EBSCOhost.

Palmer, J., & Kuiper, J. (2008, January 11). Hearing continues for bellevue officer fired over fitness. *Omaha World-Herald*, p.2. Retrieved on August 22, 2011 from ProQuest database, DOI 1411278031.

Quigley, A. (2008, June). Fit for duty? The need for physical fitness programs for law enforcement officers. *The Police Chief, 75*(6), p. 1-2.

Quire, D.S., & Blount, W.R. (1990). A coronary risk profile study of male police officers: Focus on cholesterol. *Journal of Police Science & Administration*, *17*(2), 89-94.

Siruno, L. (2009, March). Public health enforcement: Can it be justified? *Asian Bioethics Review, 1*(1), 54-55.

Summerscale, K. (2008). *The suspicions of mr. whicher: A shocking murder and the undoing of a great victorian detective*. New York: Walker & Company Publishing

Taylor, B. (2003, December 24). Fight the flab or face the sack. *London Daily Mail*, p.34. Retrieved on August 22, 2011, from ProQuest database, DOI 513496381.

Tooker, G., & Cashwell, D. (2007, September). Revisiting the fitness and health in law enforcement model program. *Commission on Accreditation of Law Enforcement Agencies*, 96, p.1.

Tooker, G., & Smith, A. (2005, February). Health and fitness in law enforcement: A voluntary model program response to a critical issue. Commission on the Accreditation of Law Enforcement Agencies, 87, p. 1-2.

United States Department of Agriculture. (2012, September 26). *Dietary guidelines for americans*. Retrieved on October 22, 2012, from www.cnpp.usda.gov/dietaryguidelines.htm

United States Department of Labor, Bureau of Labor Statistics (2009). *Paid sick leave: Prevalence, provision, and usage among full-time workers in private industry.* Retrieved on October 25, 2012, from http://www.bls.gov/opub/cwc/cm20120228ar01p1.htm

Wilson, T. (2005, April 30). It's just another brick in his wall. *The Gold Coast Bulletin*, Southport, Queensland, Australia, p. 48. Retrieved on August 22, 2011, from ProQuest database, DOI 830318281.

APPENDIX A

Table 1—Questionnaires Returned by Department

Participating Police Agencies			
	No of Officers	Percentage	Agency Size
Sacramento PD	41	18.89	Medium
Sacramento SD	31	14.29	Medium
LAPD	23	10.60	Large
San Diego PD	4	1.80	Large
San Diego SD	28	12.90	Large
Houston PD	44	20.28	Large
National City PD	21	9.68	Small
Chula Vista PD	25	11.52	Small
Totals	217	100.00	

Table 2—Participating Officer Mean Education, Height, Weight, Weekly Hours of Aerobic and Anaerobic Exercise, and Body Fat

Variable	Mean	Standard Deviation
Education	14.93 years	1.94 years
Height		
Males	70.14 inches	2.54 inches
Females	65.30 inches	3.12 inches
Weight		
Males	202.66 pounds	29.14 pounds
Females	139.50 pounds	26.44 pounds
Aerobic	2.59 hours/week	2.3 hours/week
Anaerobic	2.00 hours/week	1.98 hours/week
*Body fat	19.5 percent	4.899 percent
Years Law Enforcement	14.23 years	

*Body fat was determined by self-report. On the questionnaire, the responding officers were told to answer this question only if they knew their body fat composition.

Table 3—Aerobic, Anaerobic, or Combination of Both for 5 Plus Hours/Week, Officers Indicating Injury, Diet, and Agency Provided Fitness Center Memberships

	Yes/Percentage	No/Percentage
Fitness Program of 5+ hours per week	116/53.45	101/46.55
Injured on Duty	71/32.7	146/67.3
Diet	57/26.3	157/73.4
Agency Provided Fitness Center Membership	90/41%	127/59

Table 4—Police Officer Rating of Importance of Fitness

Police Officer Rating of Importance of Fitness		
Extremely Important	150	69.12%
Very Important	58	26.72%
Less than Very Important	9	4.14%

Table 5—Linear Regression Results of Independent Variables—Aerobic and Anaerobic Exercise, and Diet compared with Dependent Variables—Injured, Times Injured, Injury Seriousness, Sick Leave, Time Lost, Weight and Education

Independent Variables									
	Aerobic Exercise			Anaerobic Exercise			Diet		
	Standardized Coefficients			Standardized Coefficients			Standardized Coefficients		
Dependent Variables	Beta	t	sig	Beta	t	sig	Beta	t	sig
Injured	-.006	-.073	.942	-.025	-.331	.741	.035	.492	.623
Times Injured	.105	1.142	.255	.003	.029	.977	-.026	-.284	.777
Injury Seriousness	.154	1.689	.094	-.028	-.321	.756	-.060	-.688	.505
Sick Leave	-.043	-.544	.587	-.029	-.037	.712	-.014	-.189	.850
Time Lost	-.053	-.689	.492	-.021	-.160	.873	.001	.020	.984
Weight	-.174	-2.562	** .011	.020	.270	.787	.125	1.753	.081
Education	.199	2.964	** .003	.002	.025	.980	-.006	-.093	.926

**p=significance at the .01 level

Table 6—Linear Regression Results of Weight compared with Injured on Duty

Independent Variable Weight					
Dependent Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Injured	.002	.001	.155	2.286	*.023

*p= significance at the .05 level

Table 7—Pearson R Correlations Among Variables Indicating Significance

	Weight	Aerobic Exercise	Anaerobic Exercise	Injured	Sick Leave
Age	r=.256** p=.000**	r=-.152** p=.013**	r=-.163** p=.008**	r=.178** p=.004**	r=-.197** p=.002**
Years Law Enforcement	r=.239** p=.000**	r=-.213** p=.001**	r=-.184** p=.003**	r=.199** p=.002**	r=-.197** p=.002**

p*=correlation at the .05 level
p**=correlation at the .01 level