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Police officer physical fitness to work: A case for health and fitness training

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ABSTRACT

There is no reference point currently available to the Irish police force (An Garda Síochána) for measurement of baseline physical fitness or for tracking its current members, as no such data exists. Currently there is no defined health and fitness policy or strategy following a trainee Irish police force two year training period. Measurements of the various health-related components of physical fitness have been developed and, in some cases, standardised, with good to excellent accuracy and reliability (American College of Sports Medicine (ACSM, 2011), as physiological measures (as a proxy for actual physical fitness) with predictive accuracy of an individual's health outcomes better than physical activity recall (Bovet *et al.*, 2007). These measures were utilised within this research to ascertain if there were fitness changes within a group of Irish police force trainees during their period in college training. An improvement was predicted for the trainee group that was at odds with the actual findings. The focus of this particular study is to provide the information to establish if there is a need for mandatory health and fitness testing (while allowing for individual differences) for this unique Irish work force. **Key words:** POLICE FORCE, HEALTH AND FITNESS TESTING

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INTRODUCTION

The Irish police force has focused recent attention on the rising inactivity levels and difficulties in maintaining a healthy lifestyle that is prevalent in today's society and is mirrored in its employees. In the absence of minimum standards and/or regular testing how to monitor and maintain physical fitness in a police force is a topical issue. Currently there is no defined health and fitness policy or strategy following Irish trainee police officers (trainee Gardaí) during their two year training period. Equally there are no standards for a serving member of the Irish police force. At present, there is no incentive to exercise within An Garda Síochána since there is no mandatory fitness or health screening/testing carried out when a trainee graduates from the training college or while they are an Irish police force member. The focus of this particular study is to provide the information to establish meaningful fitness standards (while allowing for individual differences) for this unique Irish work force. This research documents selected fitness competency scores for Irish trainee police force, measured at two points during the two-year training period. This data may assist in the development of future minimum fitness standards or provide a resource to address issues related to job requirement physical fitness.

Being physically fit translates into fewer sick days, disabilities, and injuries – thereby reducing health-care costs (Quigley, 2008), therefore Gardaí need to be empowered and motivated to increase and maintain their levels of physical activity throughout their training and their working years. Garda recruits are required to perform at a certain level of physical fitness prior to academy selection and to pass a medical examination (Garda Representative Association, 2015). Post-academy, many officers fail to maintain these same fitness standards (Sheets, 2012) and consequences are not limited solely to the individual officer (Sheets, 2012) as fellow officers and communities are impacted (Sheets, 2012). It is worth considering what message an unfit police force member is sending to an offender.

Gettman (1998) recommends that police force workers develop unique occupational fitness and exercise requirements in comparison to other work force populations. Police force members need to be ready to respond mentally and physically to high risk situations therefore it could be reasonable to assume that the Irish police force needs above-average physical fitness to compete their duties safely and effectively (Gettman 1998). It is important that applicants meet the police fitness requirements to enable them to complete defensive tactics training and to cope with the myriad of potentially dangerous and random events that confront them every day in an operational setting as a police officer (Newcops.co.nz, n.d.). A Garda Síochána's career can span 30 years without completing or passing any mandatory health and fitness testing. An Irish police force member who joined the policed force after 1st April 2004 may retire on reaching 55 years of age subject to having completed 30 years approved service. A member who joined before 1st April 2004 may retire on reaching 50 years of age subject to having completed 30 years approved service (Garda Representative Association, 2015) without having completed any physical or fitness assessment since their training in the college.

This particular study presents fitness standards for a group of police force trainees which in turn could contribute to the development of future health and fitness trainings programmes within police training. The research used eleven outcome measures; waist measure, weight, resting heart rate, flexibility, upper body strength, abdominal strength, body mass index (BMI), blood pressure (diastolic and systolic), body composition, and estimated VO₂max. These measures are all compositions of the health related components of fitness (American College of Sports Medicine (ACSM), 2011). Measurements of the various health-related components of physical fitness have been developed and, in some cases, standardised, with good to excellent accuracy and reliability (American College of Sports Medicine (ACSM), 2011).

Literature Review

Law enforcement fitness studies

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 (Guffey, Larson & Lasley, 2015). Bullock (2007) stresses how police officers have a higher risk of developing diseases such as colon cancer, diabetes, cardiovascular disease, arthritis, and ulcers. Officers also have a high risk of obesity due to a lack of physical fitness and an unhealthy lifestyle (Bullock, 2007). The risk of developing these diseases puts police officers at a higher risk of premature death when compared to the general population (Bullock, 2007). Lee (2003) discusses that without fitness maintenance programmes for law enforcement officers the gains achieved in the academy are rapidly lost. McGill *et al.* (2013) the relevance of such functional testing within the police and the emergency response industry and note that understanding functional capacity assists ergonomists in designing standards of fitness for occupations and worker groups and also assists in designing training programs to meet job demands and injury avoidance. Boyce *et al.* (2008) completed a longitudinal study of police over 12 years with gender and ethnicity comparisons. Their sample participants included 327 police, consisting of 30 females and 297 males. They found that body composition variables increased significantly regardless of gender or race.

Bates (2006) highlights that objective measures of physical activity and physical fitness quantify the level, and with some devices, the duration, intensity and patterning of daily physical activity in individuals in ways that are not influenced by recall ability, ethnicity, culture or socioeconomic status. As a result, objective measures can provide important insights into the activity levels of participants. Bates (2006) highlights that objective measures of physical activity and physical fitness quantify the level, and with some devices, the duration, intensity and patterning of daily physical activity in individuals in ways that are not influenced by recall ability, ethnicity, culture or socioeconomic status. As a result, objective measures can provide important insights into the true activity levels of participants (Bates, 2006). Physical activity is not synonymous with physical fitness or maintenance of physical fitness, particularly occupational fitness for a police force member. One may believe that they are engaging in moderate or vigorous physical activity but actually they are not. Any individual may be physically active but they may not be active at a level to gain any significant health benefits or be operating at a safe and appropriate occupational level in order to be effective as a police force member. Unlike physical activity, there are a number of measurable components that contribute and combine to make physical fitness. Physical fitness has historically been conceptualised as comprising three components: cardio-respiratory capacity (CRC), strength, and agility (Martínez-Vizcaíno & Sánchez-López, 2008). Although the tests used to determine health-related physical fitness are somewhat heterogeneous, they include cardio-respiratory capacity, strength and muscle resistance, flexibility, and body composition (particularly adiposity – waist measurement as used in this particular research) (Martínez-Vizcaíno & Sánchez-López, 2008). Caspersen *et al.* (1985) identified that the health-related components of physical fitness (as used in this study) are (a) cardiorespiratory endurance ($\dot{V}O_2$ max), (b) muscular endurance (press-ups and sit-ups), (c) muscular strength (press-ups and sit-ups), (d) body composition (body fat test), and (e) flexibility (sit and reach test). ‘Just as the amount of physical activity ranges from low to high so do the level of physical fitness’ (Caspersen *et al.*, 1985, p128).

Both physical activity and physical fitness vary among members of a police force population as it does within any population (Quigley, 2008). No member of the Irish Police Force (An Garda Síochána) does no activity whatsoever – everyone is active or fit to greater or lesser degrees but they may not be active enough to derive significant health and fitness benefits. It may be appropriate for the Irish police force to use operational definitions such as ‘occupational fitness’ when it is necessary to categorise members of the Garda Síochána into those who achieve certain levels of fitness and those who do not, for example following a fitness test for entry as a trainee Garda (Caspersen *et al.*, 1985). As stated previously there is no reference point currently

available to the Gardaí for measurement of baseline physical fitness or for tracking its current members, as no such data exists. Currently there is no defined health and fitness policy or strategy following a trainee Garda's two-year training period.

Irish Police Force Training Programme

Basic Irish police force training is divided into three phases as per figure phases and lasts two years (see figure 1). Initially, students spend 20 weeks at the Garda College, (Phase 1), followed by a period of up to 20 - 24 weeks spent at selected training stations under the direct supervision of tutorial staff (Phase 2). After further training (Phase 3), students become members of the Garda Síochána (Irish Police Force) and are attached to permanent stations. While students are now empowered to enforce legislation, they remain under probation for a further two year period.

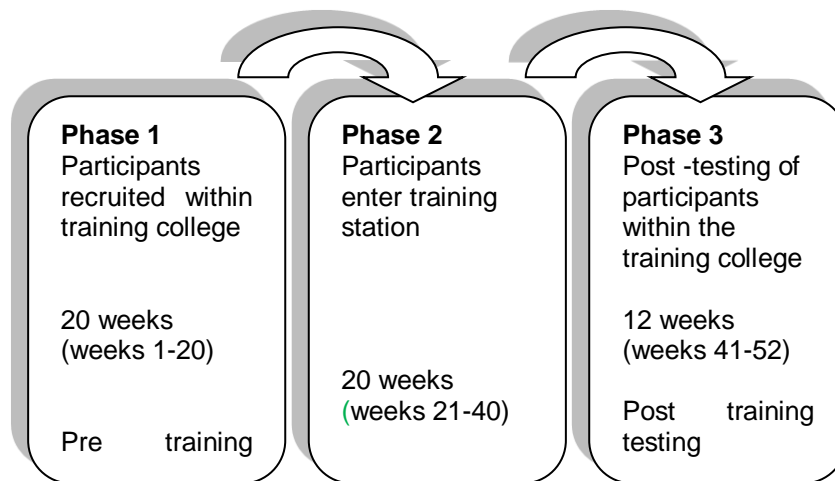


Figure 1. Outline of Project Schedule and Data Collection

METHODS

Study Design

The main aim of this study was to investigate self-efficacy to exercise on trainee Gardaí and its relationship with health and fitness performance measures. In a single-group experiment, a pre-test and a post-test are given to one group to measure the effect of a particular programme. This design compares the same group of participants before and after the programme. The purpose of the single group pre-test post-test design is to determine if participants changed over their training time. This study design does not indicate, however, whether a programme caused improvement in participants; there is no way to distinguish between changes over time due to other factors and effects specific to the program without using a control group (Bordens & Abbott, 1996). Within this particular study before a programme was introduced, the measures were pre-tested. In the next step the Garda training programme commenced. Lastly, the measures were post-tested compared to the pre-test, and the scores were then analysed for pre-post differences. In this particular study, data was collected without introducing any treatment and its primary purpose was an explanatory design (Johnson, 2001).

Participants

The participant group consisted of 273 police force trainees of which 188 (68.9%) were male and 85 (31.1%) female. All were trainee police force members, studying, for their BA in Policing Studies. The study was commissioned by the physical education department of the Irish police force training college and was completed as part of a doctoral programme of study. Research ethics consent was sought and obtained from Glyndŵr University. All students were officially asked to participate in the study by the College authorities and were provided with information sheets and consent forms. The consent form stated that the student was free not to undertake the study and that non-participation would not in any way affect their studies within the college. In addition all students were health screened using the standardised physical activity readiness questionnaire (PAR Q).

Physiological data testing procedures

All equipment required for undertaking the eleven measures (stadiometer, blood pressure monitor, bioelectrical impedance analysis machine, sit-and-reach box) was calibrated prior to testing. Session organisation were paramount and ensured the testing session ran smoothly. Prior to testing the study was briefly explained and instructions were provided to all the testers. Trainees were informed both verbally and on the information sheet that all testing results were stored in a secure location on a password-protected file and backup on a cloud storage database (Dropbox).

Physiological and health data collection measurements

The order and sequence of the pre- and post-tests (all physiological data was collected at time 1 and time 2) consisted of:

Stage 1 (Studio environment - with private rooms for measurement of waist circumference):

1. Height
2. Weight
3. Waist circumference
4. Blood pressure was measured using an Omron M6 digital blood pressure monitor
5. Resting heart rate
6. Body composition was measured using the Tanita system of Bioelectrical impedance analysis (BIA)
7. Flexibility using the sit and reach

Stage 2 (Gymnasium environment):

1. Press-up test to exhaustion
2. Sit-up test, the one minute test
3. 20-metre shuttle test (VO₂max)

Each testing group was large (up to 40 trainees per group) and a testing stations system was operated, allowing for a different tester at each station, who conduct and record their assigned test for each day of testing. Because testing order can affect performance in some physiological measures, subjects were asked to sit for a minimum of 5 minutes prior to taking their blood pressure and resting heart rate (ACSM, 2014). No maximum tests (stage 2 gymnasium environment) were conducted before these studio measurements were taken. The estimated VO₂max test, which required maximal effort and may therefore cause fatigue, was scheduled at the end of the testing session in the gymnasium environment to allow for measurement for the 20 meter shuttle run.

Limitations of the Study

It was not feasible for the researcher to track all of the possible combinations and range of variables of the participants; the students may or may not have participated in extra fitness training throughout their time in the Garda College. The participants' exercise experiences away from the programme cannot be accounted for. Since actual or self-reported exercise behaviour was not recorded (at both pre- and post-), it is unclear to what extent exercise activity changed. While physical activity is considered behaviour with a degree of choice by the individual involved, physical fitness is an attribute, and fitness components include cardio-respiratory endurance, muscle strength and endurance, flexibility and body composition (Luke *et al.*, 2004). In particular, maximal oxygen uptake (VO₂max) is considered the gold standard to assess cardiovascular fitness. Assessment of physical fitness requires the conduct of several tests as compared to questionnaire to assess physical activity. The quantitative nature of physical tests underlines that physical fitness can be assessed more reliably and precisely than questionnaire-based physical activity (Bovet *et al.*, 2007). Accordingly, the twenty-meter shuttle test was conducted instead at pre- and post-testing to assess estimated VO₂max.

Data Analysis

The researcher used the Statistical Package for the Social Sciences (SPSS version 21) to perform the descriptive statistical calculations, the inferential statistical analyses, t tests, the ANOVA, and correlation analysis. The level of statistical significance was set at .05 for all types of statistical analyses (Stevens, 1996). Descriptive statistics were used to illustrate the basic features of the data in the study and to present the quantitative descriptions in a manageable form. Repeated Measures ANOVA was implemented as a Univariate General Linear Model.

RESULTS

Table 1. Age of Total Participants

Characteristic	All	Group
	*n = 273	n = 273
	24 ± 4	24 ± 4

Mean age of the total group is 24 with a standard deviation of 4.

Table 2. Gender Demographics

	Gender		Total	Sig.*
	Male	Female		
GroupCount	188	85	273	0.388
% within groups	68.9	31.1	100.0	

* chi squared test

The above table (tables 1 and 2) show that group did not differ statistically significantly with respect to gender mix. It was not considered necessary, therefore, to control for this variable in subsequent analyses.

Table 3. Baseline (Time 1) Demographic for all Physiological Measures

	<i>M (SD)</i> <i>n=273</i>	<i>Comment</i>
Weight	78.8 ± 14	Dependent on height for both males and females
Waist	85 ± 10	Normal range
BMI	25 ± 3.2	Falls into the overweight range
Body composition	23±7.7	23% is normal for female but over fat for male
Sit-ups	22±5	Average for male and female
Press-ups	25±17	Average for male and female
Flexibility	19±7	Good for male and female
Systolic	137±16	Pre hypertension for male and female
Diastolic	72±10	Normal
Resting Heart Rate	79±12	Below average for male and female
Estimated Vo2 max	42±8	Fair for a male and good for a female

Legend. n = sample size; ± Standard deviation is displayed for each variable

In Table 3, waist and flexibility scores are ranked as good for both males and females and the press-up score is average for both males and females. It is interesting to note at baseline that the BMI mean score of 25 falls within the overweight category (25 – 29.9) for BMI as recommended by the WHO (1998). The mean body composition (body fat percentage) of 23% in the Table above is considered normal for a female but is considered overweight for a male. The sit-up mean of 22 is ranked as poor for both males and females. The estimated VO_{2max} of 42 is considered fair for a male and good for a female when compare to the norms.

A resting heart rate of 79 beats per minute is ranked below average for males and female. As shown in Table 3 blood pressure is 137/72 mm Hg. Typically more attention is given to the top number (the systolic blood pressure) as a major risk factor for cardiovascular disease for people over 50 years old. Systolic, the top number – which in this case is 137 mm Hg – is the higher of the two numbers; this measures the pressure in the arteries when the heart beats and contracts. Diastolic, the bottom number – which is 72 mm HG – the lower of the two numbers, measures the pressure in the arteries between the heartbeats (when the heart muscle is resting between beats and refilling with blood). In most people, systolic blood pressure rises steadily with age due to increasing stiffness of large arteries, long-term build-up of plaque and increased incidence of cardiac and vascular disease (American Heart Association, 2015). A systolic blood pressure score of 137 ranks the participants as having prehypertension (American Heart Association, 2015). The cut off levels for high blood pressure does not change with age.

The next section of the results, compares physiological (health and fitness outcomes) measurements pre- and post-study, and investigated to determine whether changes in these variables differed significantly.

Table 4. Summary of Physiological Variables at Time 1 and Time 2

Measure	Group	Time 1 Mean (SD)	Time 2 Mean (SD)	Effect size	Sig. (Time)	Eta- squared	Comment	
Weight	1	78.8±14	81 ±14	3	0.001*	0.360	Significant increase in weight, decline in health/fitness	
Waist	1	85 ± 10	88± 10	3	0.001*	0.362	Significant increase in waist, decline in health/fitness	
BMI	1	25 ± 3.2	26 ± 3	1	0.001*	0.371	Significant increase in BMI, decline in health/ fitness	
Body Composition	1	23±7.7	23±6	0	0.003*	0.002	No change in body composition	
Sit-ups	1	22±5	27±7	5	0.001*	0.365	Significant improvement in sit-ups, improvement in health/ fitness	
Press-ups	1	25±17	30±19	5	0.001*	0.360	Significant improvement in press-ups, improvement in health/ fitness	
Flexibility	1	19±7	20±7	1	0.001*	0.250	Significant improvement in sit-ups, improvement in health/ fitness	
Systolic Pressure	Blood	1	137±16	131±14	-6	0.056	0.010	Improvement in systolic blood pressure, improvement in health/ fitness
Diastolic Pressure	Blood	1	72±10	74±10	2	0.001*	0.035	Significant increase in diastolic blood pressure, decline in health/ fitness
Resting Rate	Heart	1	79±12	73±13	-6	0.001*	0.102	Improvement in systolic blood pressure, improvement in health/ fitness
Estimated VO _{2max}		1	42±8	40±7	-2	0.003*	0.030	Improvement in systolic blood pressure, improvement in health/ fitness

Note. p-values displayed were obtained from Repeated Measures ANOVA.

Asterisks indicate significance at the 5% level, † group n=274

Nearly all physiological measures changed significantly over the course of the study (Table 4). Some of these changes (e.g. weight, waist, BMI, VO_{2max} measurements) do not represent improvement in terms of fitness or physical well-being. Maximal oxygen consumption (VO_{2max}) is the single best measure of cardiorespiratory capacity and is considered as a benchmark to quantify cardiovascular functional capacity and aerobic fitness (Koley, 2006), and this decreased by a mean score of two; a mean post- score of 40 for the VO_{2max} is considered poor for men and fair for women. Cardiovascular capacity decreased significantly from time 1 to time 2. There were increases in Waist within the group, systolic blood pressure improved, and there were improvements in Flexibility and Resting Heart Rate. Press-up and sit-up scores also improved which indicates that local muscular strength and endurance has changed for the better for the participants.

DISCUSSION

This programme did not directly manipulate any environmental issues or barriers, but provided health and fitness testing pre and post a police force training programme. Up to now, there have been no other studies in Ireland examining the Irish police force and to establish their health and fitness levels. The present study provides valuable data for this unique population, with data relating to trainee police force members and how these physiological variables change from Phase 1 to Phase 3 (see fig 1) of their training. As trainee Irish police force member progress through their training, adverse changes health and fitness variables are a startling finding for Garda management. Changes in weight, waist, BMI, VO_{2max} measurements decreased from pre to post testing (see table 4). These findings support the need for strategies to be specifically addressed to combat these issues. To date, no other physiological data exist on the Irish police force in relation to health and fitness screening. Within the Irish police force management there are current discussions to implement and set the health and fitness standards to determine appropriate or required fitness levels for new trainee recruits. These health and fitness findings also offer potential guidance to police force management on fitness standards for recruits when in training.

There are no physical fitness goals for the Irish police force when they are trainees or an active member of the police force. Locke and Latham (1990) describe goals as the object or aim of an action. With any external pressures on trainees to work towards physical fitness goals, only the normal health motivators such as those available to the general population still exist for Gardaí. This particular study highlights the possibility that management within An Garda Síochána need to explore the introduction of fitness testing or incentives throughout a Garda's career (and training programme). Similar types of testing procedures can be found internationally and nationally within the Irish Defence Forces. Currently, the Irish Defence Forces conduct annual fitness testing consisting of a one minute press-up test, a one minute sit-up test, a 3.2 kilometre run (soldiers of 40 years or older may do the 4.8 kilometre walk instead) and a loaded 10 kilometre march over flat ground wearing combat dress (no headdress) and carrying combat equipment. Soldiers over 50 years of age are exempt from the loaded march unless undertaking a career course or travelling overseas (see military.ie, n.d.). All males and females complete the same tests, yet grading norms are different for genders. Grade 4 is considered a pass score in relation to one's age and level reached on every test. A soldier's fitness grading is the average of the three grades received. For example, if a soldier receives a Grade 2 in the run, a Grade 3 in press-ups and a Grade 1 in sit-ups, his or her grade would be $2+3+1 = 6$, divided by 3 (the 3 tests), giving an average of Grade 2 (Defence Forces Ireland, n.d.).

In August 2014 the United Kingdom police force issued guidelines on how police forces in England and Wales should carry out officer fitness tests. The test (all details of which are available at <http://www.college.police.uk/en/19833.htm>), is designed to match the aerobic demands of personal safety training. Interestingly this is a similar standard to the multi-stage fitness test used when recruiting police

officers in Ireland and conducted for this particular study. The test involves a 15-metre shuttle run, to be completed to an endurance level of 5:4 on the multi stage bleep/shuttle test (this is also the same test that was used in this particular study). There is no obstacle course or upper strength testing as part of this annual fitness test. There are also job-related fitness tests for specialist posts within the Welsh and English police forces. These include fitness standards for 13 specialist posts including firearms officers, dog handlers and police cyclists. The guidance, which is based on Recommendation 33 of the Winsor Review (Part II), emphasises the need for forces to provide support and advice to officers in order to pass. If an officer is not able to pass the fitness test at the first attempt, the College advises forces to provide support and allow at least two retakes. If all appropriate support measures and alternatives have been delivered and the officer is still unable to achieve the required standard, the College advises forces to use the unsatisfactory performance procedures as set out in the Police (Performance) Regulations 2012 procedure (College of Policing, n.d.).

Conceivably the Irish Police force could adopt a similar type of annual fitness testing (i.e. age and gender specific) to provide a training incentive for trainee and qualified Gardaí and a tool for managing workforce fitness. Austin and Vancouver (1996) and Beattie *et al.* (2015) describe similar incentives as 'need goals'; that the trainees are provided with standards and goals throughout their training that they must meet. Boyce *et al.* (2009) highlight the benefits gained from maintaining ongoing fitness training and testing with law enforcement officers.

The findings in this particular study, that females' overall physiological measurements decreased more than males, is reflective of what is happening in society, not just the Irish police force, and this supports the previous work of Sallis *et al.* (1986), and The US Centers for Disease Control and Prevention (CDC, 2007). The Irish SLÁN surveys of 1998 and 2002 (Murtagh *et al.*, 2014; Get Ireland Active Guidelines, 2013, Friel *et al.*, 1999; Kelleher *et al.*, 2003) highlighted that females were not taking part in enough physical activity to meet the recommended daily amount compared to males. Furthermore, they found that more females took part in no leisure time physical activity. Traditionally girls are less active than boys and do not meet the recommended physical activity guidelines and this particular trend is now replicating itself in adulthood (Murtagh *et al.*, 2014; Get Ireland Active Guidelines, 2013; Kelleher *et al.*, 2003; Friel *et al.*, 1999).

A further explanation as to why female health and fitness scores decreased more significantly than males is that perhaps the Garda training programme was possibly not tailored to suit female populations. Ashford *et al.* (1993) found a gender difference in relation to motives to physical activity. Health and fitness motives (physical well-being and socio-psychological well-being) were reported higher by females compared to males, who rated performance motives higher ($p = 0.05$). Ryan *et al.* (1997) revealed, from their study of 155 males and females, that females were significantly more likely than males to exercise for reasons relating to appearance and fitness ($p < 0.01$).

The Cooper Institute for Aerobics Research (CIAR) has developed fitness programmes in law enforcement, public safety, and the military since 1976. Over the years, the CIAR has considered this work as part of their mission to help shape and influence fitness programmes throughout the USA. The Institute considers fitness in law enforcement a necessity as it relates to the ability of officers to perform essential functions of the job. Physical fitness relates to minimising the risk of excessive force situations and to minimising the known health risks associated with the job. Lastly physical fitness relates to meeting many legal requirements to avoid litigation and have a defensible position if challenged in court (CIAR, 2000). The importance of implementing physical fitness into law enforcement training is paramount; however the difficulty comes with determining

the best way to do it. Nevertheless physical inactivity and lack of exercise remain a growing problem in police force populations.

CONCLUSIONS AND RECOMENDATIONS

This study provides information to establish meaningful fitness standards for this unique Irish workforce, from recruitment of future trainees to establishing cut off and guidelines for future fitness tests. Consequently, additional strategies need to be explored in relation to An Garda Síochána and physical activity/exercise programmes and their impact on these outcomes. Female trainees' physiological scores decreased more significantly than males. This is a finding that warrants future gender-specific research. The physiological results found within this particular study can guide towards finding meaningful fitness standards for trainees within An Garda Síochána. It is recommended and research findings highlight the need to develop gender-specific research and programmes that targets female Gardaí specifically. There is also scope for An Garda Síochána to develop and introduce mandatory fitness testing or health screening. Similar types of testing can be found internationally in other police forces (e.g. the Welsh and English police force) and nationally within the Irish Defence Forces. This would aid as an incentive to all trainee Gardaí to maintain their health and fitness. Weight management, physical activity and currently a lack of health and fitness testing has been a long-term debate within the Irish police force. Currently, the Gardaí have established an in-house Task Force to examine these issues. It is hoped that this research will contribute to the debate.

Furthermore, additional assessment studies are needed to build on the current understanding of physical activity levels and practices of the Irish police force. A longitudinal study using random samples, lasting one to two years, with repeated follow-ups and repeated measurements, needs to be carried out to further evaluate the maintenance of fitness levels within the Irish Police force.

The health and fitness findings within this study are a starting point for physical future research within the Irish Police Force. This study provides the baseline information to establish meaningful fitness standards for this unique Irish workforce, from recruitment of future trainees to establishing cut off and guidelines for future fitness tests.

REFERENCES

1. American College of Sports Medicine (2011). Available at: <http://www.acsm.org/about-acsm/media-room/news-releases/2011/08/01/acsm-issues-new-recommendations-on-quantity-and-quality-of-exercise> (accessed October 2015).
2. American College of Sports Medicine (2014). *Guidelines for Exercise Testing and Prescription*, 9th edition, Baltimore, Lippincott, Williams and Wilkins.
3. American Heart Association (2015). Understating blood pressure Available at: http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/AboutHighBloodPressure/Understanding-Blood-Pressure-Readings_UCM_301764_Article.jsp, (accessed March 2015).
4. Ashford, B., Biddle, S. & Goudas, M. (1993). Participation in community sports centres: motives and predictors of enjoyment. *Journal of Sports Science*, 11, 249-256.
5. Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin*, 120, 338-375.
6. Bates, H. (2006). *Daily Physical Activity for Children and Youth A Review and Synthesis of the Literature*, Alberta Education, Learning and Teaching Resources Branch. Available at: <http://education.alberta.ca/media/318711/dpa4youth.pdf> (accessed June 2015).

7. Beattie, S., Hardy, L., & Woodman, T. (2015). A longitudinal examination of the interactive effects of goal importance and self-efficacy upon multiple life goal progress. *Canadian Journal of Behavioural Science, 47*, 201-206.
8. Bovet P., Auguste R. & Burdette, H. (2007). Strong inverse association between physical fitness and overweight in adolescents: a large school-based survey, *International Journal of Behavioral Nutrition and Physical Activity, 4*, 24.
9. Boyce, R.W., Jones, G.R., Schendt, K.E., Lloyd, C.L. & Boone, E.L. (2009). Longitudinal changes in strength of police officers with gender comparisons. *Journal of Strength and Conditioning Research, 23*, 2411-2418.
10. Boyce, W. R., Ciulla, S., Jones, R. G., Boon, E., L, Elliott, M. L., & Combs, S. C. (2008). Physical Fitness Comparison of the Charlotte Mecklenburg Fire and Police Departments. *International Journal of J Exercise Science 1*, 125-135.
11. Bullock, T. (2007). Police officer injury study. VML Insurance programs, *Law Enforcement Newsletter, 1*, 2.
12. Caspersen, C.J., Powell, K.E. & Christensen, G.M. (1985). Physical activity, exercise and physical fitness: definitions and distinctions for health-related research. *Public Health Reports, 100*, 126-131.
13. Center for Disease Control. (2007). *US Physical Activity Statistics*. Atlanta, GA: Centers for Disease Control and Prevention. Available at: <http://apps.nccd.cdc.gov/PASurveillance/DemoComparev.asp> (accessed May 2015).
14. Cooper Institute for Aerobic Research (2000). *Common Questions Regarding Physical Fitness Tests, Standards, and Programs for Law Enforcement Dallas, TX*. Buckingham: Open University Press.
15. Defence Forces Ireland n.d. Defence Forces Fitness Test. Available at: <http://www.military.ie/careers/fitness-testing-centre/defence-forces-fitness-tests/> (accessed August, 2015).
16. Friel, S., Nic Gabhainn, S. and Kelleher, C. (1999). The National Health and Lifestyles Surveys. Survey of Lifestyle, Attitudes and Nutrition (SLÁN) and the Irish Health Behaviour in School-aged Children (HBSC) Survey 1998, Department of Health and Children. Dublin: The Stationery Office.
17. Garda Representative Association: Available at: Listed Salary Scales Available at: <http://www.gra.cc/pensions.shtml> (accessed May 2015).
18. Get Ireland Active Guidelines. (2013) Physical Activity Guidelines. Available at <http://www.getirelandactive.ie/get-the-guidlines/how-much-physical-activity-should-i-be-doing/> (accessed June, 2015).
19. Gettman, L. R. (1998). Occupational related fitness and exercise adherence. In R.K. Dishman (Ed.), *Exercise Adherence: Its impact on public health* (pp. 352).
20. Guffey, E. J., Larson, G. J. & Lasley, J. (2015). Police officer fitness, diet, lifestyle and its relationship to duty performance and injury, *Journal of Legal Issues and Cases in Business*, Available at <http://www.aabri.com/manuscripts/131469.pdf> (accessed September 2015).
21. Johnson, B. (2001). Toward a new classification of nonexperimental quantitative research. *Educational Researcher, 3*, 3–14.
22. Kelleher, C., Nic Gabhainn, S., Friel, S., Corrigan, H., Nolan, G., Sixsmith, J., Walsh, O. & Cooke, M. (2003). The National Health and Lifestyle Surveys: Survey of Lifestyle, Attitudes and Nutrition (SLÁN) and the Irish Health Behaviour in School-aged Children (HBSC) Survey 2002, Department of Health and Children. Dublin: Government Publications. Available at: www.dohc.ie/publications/national_health_and_lifestyle_surveys_2003.html (accessed June 2015).
23. Koley, S. (2006). Association of Cardio respiratory Fitness, Body Composition and Blood Pressure in Collegiate Population of Amritsar. *The Internet Journal of Biological Anthropology. 1* 1.

24. Lee, J.C. (2003). Police fitness: The effects of activities, service, limitations, and programs on fitness and retirement. Unpublished doctoral dissertation, University of Southern.
25. Luke, A., Philpott, J., Brett, K., Cruz, L., Lun, V., Prasad, N., Zetaruk, M. (2004). Physical inactivity in children and adolescents: CASM AdHoc Committee on Children's Fitness. *Clinical Journal of Sport Medicine*, 14, 261-6;
26. Martínez-Vizcaíno V. & Sánchez-López M (2008). Relationship Between Physical Activity and Physical Fitness in Children and Adolescents, *Revesta Espanola Cardiologia*, 61, 108-11.
27. McGill, S.M., Frost, D., Lam, T., Findlay, T., Darby, K. & Andersen, J. (2013). Fitness and movement quality of emergency task force police officers: A database with comparison to populations of emergency services personnel, athletes and the general public. *International Journal Industrial Ergonomics*, 43, 146–153.
28. Murtagh, E., Murphy, M., Murphy, N., Woods, C., & Lane, A. (2014). *Stay Active: the physical activity, ageing and health study*. Dublin: CARDI and Mary Immaculate College.
29. New Zealand Police (n.d.): *Police Entry Requirements and Assessments* Available at: <https://www.newcops.co.nz/application-process/requirements> (accessed March 2015).
30. Quigley, A. (2008). *Fit for Duty? The Need for Physical Fitness Programs for Law Enforcement Officers* Adrienne Quigley, Arlington County, Virginia, Police Department; and IACP Available at: at http://www.policechiefmagazine.org/magazine/index.cfm?fuseaction=display&article_id=1516&issue_id=62008 (accessed March 2015).
31. Ryan, R.M., Frederick, C.M., Lipes, D., Rubio, N. & Sheldon, K. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*, 28, 335-354.
32. Sallis, J.F., Haskell, W.L., Fortmann, S.P., Vranizan, C.B. & Solomon, D.S. (1986). Predictors of adoption and maintenance of physical activity in a community sample. *Preventive Medicine*, 15, 331-346.
33. Sheets, S. (2012). Fitness and the Police Officer. *Journal of Law enforcement*, 3.
34. Stevens, J. (1996). *Applied multivariate statistics for the social sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
35. Violanti, J. (2007). *Dying from the Job: The Mortality Risk for Police Officers*. Available at: www.cophealth.com/articles/articles_dying_b.html (accessed June, 2013).