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An Investigation of the Relationship between Education, Credentials and Knowledge of Personal Trainers and Client Retention

by

John H Preston

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science

Approved April 2018 by the
Graduate Supervisory Committee:

Cheryl Der Ananian, Chair
Christopher Berger
Jesse Vezina

ARIZONA STATE UNIVERSITY
May 2018

ABSTRACT

The purpose of this study was two-fold. In Specific Aim One, we examined the associations between education level, personal trainer credentials and characteristics, and knowledge of exercise science and personal training principles. In Specific Aim Two we examined associations between education, personal trainer credentials and knowledge of personal trainers with client retention. This study utilized a cross-sectional research design. An anonymous electronic survey was used to collect the data. Eligible participants (N=226) were individuals who were providing one-on-one personal training services for at least one client. All data were assessed for normality prior to data analysis. Descriptive statistics were used to evaluate sample characteristics. Mean and standard deviations, median and interquartile range [IQR] or frequency and percentages were reported for the sample characteristics. Bivariate associations were examined with dependent t-tests and one-way ANOVAs for normally distributed data. Mann-Whitney U and Kruskal-Wallis tests were used for non-normally distributed variables. The median knowledge score for the sample was 6.0 [3.00] points, out of a possible 24, with 92.5% of the sample scoring 10 or lower. Sex (Male/Female), education level, having a degree in the field, certification status (yes/no) and number of certifications were not associated with knowledge scores ($p > 0.05$). Years of experience in personal training was positively associated with mean knowledge scores ($H(3) = 9.280$, $p = 0.026$). Sex of the personal trainer, having a degree in the field (yes/no), the number of personal trainer certifications, the cost of training, the type of facility, the type of employment of the personal trainer and knowledge scores were not associated with client retention ($p > 0.05$). Education level ($F_{3,87} = 8.176$, $p < 0.001$), personal training certification (yes/no) ($t_{38} = 2.277$, $p = 0.029$), years of experience ($F_{3, 87} = 3.169$, $p = 0.028$), facility size ($F_{4,84} = 8.049$, $p < 0.001$), and exercise science degree type ($F_{3,48} = 6.008$, $p = 0.001$) were all associated with client retention. This study provides insight on knowledge retention of active personal trainers on subject matter deemed foundational by four certifying organizations. The findings should influence both the preparatory learning and well as continuing education approaches of both certifying organizations and institutions of higher learning.

DEDICATION

This is dedicated to my loving husband Carl. You have been by my side each and every step of the way as I've pursued my graduate studies and completed this Thesis. You were there as we hiked through the McDowell Mountains five years ago, discussing if a return to graduate school was the right choice for me, the second half of my career and most importantly us. Once the decision was made your support and encouragement never wavered. Whenever I needed to make the time to read, study or write you always patiently allowed for it and found something else to do. You've been an expert proofreader even when the subject matter was of little interest to you. Despite the fact that all of this occurred during some of our prime years together you never complained when we had to modify travel plans, vacations or family visits because of my schedule. We somehow even found the time to get married during the middle of this journey. There is no doubt in my mind that I would have been able to complete this project and finish graduate school on my own. It is only because of you that it was possible. I will never be able to fully express in words how thankful, appreciative and grateful I am to share my life with you. I love you!

ACKNOWLEDGMENTS

I would like to acknowledge my program director, Principle Lecturer, Dr. Ann Sebren for her continual support of this project and the flexibility with which she allowed me to progress through my graduate studies. I would also like to acknowledge my committee members, Clinical Assistant Professor, Dr. Christopher Berger and Jesse Vezina M.S., Lecturer, for your guidance, expertise and contributions to this project throughout the entire process. I especially must acknowledge my committee chair, Associate Professor, Dr. Cheryl Der Ananian for recognizing my passion and allowing me to follow it, despite your warnings that this would be a very big project. Turns out that you were correct, yet you questioned, challenged, pushed and supported me every step of the way. Without your dedication to this study it would not have been nearly the quality and success that it turned out to be, thank you. Thank you to the faculty at Arizona State University for their guidance and wisdom through my graduate studies. I would like to also express my deep gratitude to the respondents who have graciously given their time to participate in this study without which it could not have been completed. Lastly, I would like to thank my family and friends who have continuously supported me during this journey.

Funding from the ASU Graduate & Professional Student Association (GPSA) and Graduate Education, Graduate Research and Support Program (GRSP)

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INTRODUCTION

The health benefits of physical activity (PA) are well established. Decades of scientific research have consistently demonstrated the benefits of regular exercise for the prevention of many chronic diseases, enhancement of athletic performance, pain management, improvement of activities of daily living, weight loss and weight management, and quality of life measures (Physical Activity Guidelines Advisory Committee Report, 2008). Research demonstrates exercise is beneficial in reducing the risk of coronary artery disease, stroke and some forms of cancer, including breast cancer, colon cancer and prostate cancer (Haskell et al., 2007; Kesaniemi et al., 2001; Wenger et al., 1995). Exercise is helpful in managing obesity and Type II Diabetes (Zaccardi et al., 2015). Additionally, exercise has been shown to help control blood pressure (Hegde & Solomon, 2015) and blood lipid levels (Hung et al., 2015). In recent years, sedentary behavior has been included as an independent risk factor for heart disease and stroke (Menai et al., 2015). Some research suggests that sedentary behavior is as detrimental to overall health as is smoking cigarettes (Thyfault, Du, Kraus, Levine, & Booth, 2015).

Despite the well-established benefits of exercise and numerous public health guidelines recommending regular participation in moderate to vigorous PA on most days of the week and strength-training on at least two days per week, (Pescatello, L., & ACSM, 2014) exercise participation rates remain sub-optimal. There is still a high percentage of inactive adults with nearly 33% of the U.S. population reporting no leisure time physical activity (Pleis, J. R., Lucas, J. W., & Ward, B. W., 2009). Currently less than 10% of the population meet the current PA guidelines when PA is measured objectively using accelerometry (Tucker, J. M., Welk, G. J., & Beyler, N. K., 2011).

Individuals often join a health and fitness facility or gym to become more active. According to the International Health, Racquet, and Sports Clubs of America (IHRSA) 52.9 million adults or 23.1% of the U.S. adult population were American health club members in 2015 (www.ihrsa.org/consumer-research/). Of those 52.9 million, 23.2 million were "core" members, or members who used the club at least 100 times a year. Moreover, 8 million people used the services of a personal trainer in 2015 (www.ihrsa.org/consumer-research/). While the use of a

personal trainer by 8 million people only represents 2.5% of the United States population of (United States Census, 2017), it represents 15.1% of all gym members and 34.4% of what IHRSA has defined as a "core" member. This data suggests individuals who belong to fitness facilities are seeking the services of personal trainers. Moreover, there is an association between frequency of gym use and the use of personal trainers implying that personal trainers may play a role in consistency of exercise participation (www.ihrsa.org/consumer-research/).

Over the past two decades, there has been a significant growth of the fitness industry. According to U.S. Fitness Center, health and fitness club membership has grown from 32.8 million in 2000 to 54.1 million in 2014 (US Fitness Center, 2015). Paralleling this growth is an anticipated job growth for personal trainers. According to the United States Bureau of Labor Statistics there were 299,200 personal trainers in the United States in 2016 (http://www.bls.gov/ooh/personal-care-and-service/fitness-trainers-and-instructors.htm). It is projected the number of personal trainers will increase by 10% between 2016 and 2026, adding an additional 30,100 personal training jobs by 2026. As more people use health and fitness clubs and seek the services of personal trainers, an opportunity exists for the profession to address physical inactivity and potentially improve health outcomes.

Despite the recent growth of the fitness industry and the continued expansion of the body of knowledge of the exercise sciences there has been a simultaneous increase in the prevalence of chronic diseases in the United States (Bauer, Briss, Goodman, Bowman, 2014). Personal training services should continue to be an option for individuals who are interested in addressing physical inactivity and associated chronic diseases. This type of role for personal trainers could be beneficial to the overall health care industry, because a preventative approach to managing health may result in an overall decrease in healthcare costs (Cecchini, 2015).

In addition to opportunities that exist for personal trainers to work with special populations and people with risk factors for cardiovascular disease, personal trainers also work with apparently healthy clients. The personal trainer's clientele may include those who have goals related to athletic performance, feeling better, stress management or physique transformation. Personal trainers need to have a broad skill set to accommodate the potential diverse needs and

goals of their clients. The ability of personal trainers to improve physical inactivity and health outcomes as well as work with apparently healthy adults may be dependent on factors such as educational training, certification and knowledge or skills. To date there is no singular educational standard required for personal trainers to enter the profession and this may influence the effectiveness and skills of personal trainers. Personal trainers can earn their credentials and secure employment through numerous pathways. Obtaining an associate or bachelor's degree in a Kinesiology or an Exercise Science related field is a common pathway for becoming a personal trainer but a college degree is not mandatory. Personal trainers can also obtain numerous certifications to prepare for their career. The quality and rigor of these certifications vary as do the qualifications to sit for certification.

To the best of our knowledge, no clear data exists on the percentage of personal trainers who have a bachelor's degree in an Exercise Science related field. Survey data collected by (Schroeder, 2015) shows that 77% of employers consider a college degree as a criterion when making personal trainer hiring decisions. Likewise, 67% of employers considered a degree when making determinations related to compensation. Nearly 32% of employers considered a degree when making decisions about pay raises and 48% considered a degree as a criterion for promoting personal trainers. Findings also suggested employers considered certification 99% of the time when hiring, 82% of the time for compensation decisions, 52% of the time for raises and 59% of the time for promotion (Schroeder, 2015). This data suggests employers may find personal training certifications more important than a degree when making personnel decisions such as who is hired or promoted. To the best of our knowledge, data on the reasons why employers may prefer personal training certification to a degree are not available.

Personal trainers can select from a variety of options for obtaining a bachelor's degree. These options include a degree in Kinesiology, Biomechanics, Exercise Science, Exercise Physiology, Exercise and Wellness, Strength and Conditioning among others. In general, attaining a bachelor's degree from an accredited college or university is relatively homogenous, in terms of credit hours, time commitment, and depth of the subject matter being studied. Most bachelor's degrees require approximately 120 credit hours to complete. In comparison, the

requirements for certification vary substantially. Some organizations providing personal training certifications are accredited through the National Commission for Certifying Agencies (NCCA) while other organizations providing personal training certifications are not NCCA accredited. See Table 1 for a comparison of the prerequisites for some of the well-known accredited fitness industry certifications.

Table 2. Requirements for eligibility to sit for certified personal trainer exams

	ACE CPT[a]	ACSM CPT[b]	AFFA CPT[c]	CI CPT[d]	NASM CPT[e]	NFPT[f]	NPTI CPT[g]	NSCA CPT[h]
18 Years of Age	X	X		X	X	X	X	X
CPR	X	X	X	X	X		X	X
High School/GED	X	X				X	X	X
Accredited	X	X		X	X	X		X
US Government ID	X		X			X	X	
Four year degree								
Six months of in-person learning							X	
Online learning	X	X	X	X	X	X		X
In-person learning		X					X	X

[a]ACE-CPT American Council on Exercise Certified Personal Trainer (https://www.acefitness.org/fitness-certifications/personal-trainer-certification/default.aspx, 2017), [b]ACSM-CPT The American College of Sports Medicine, Certified Personal Trainer (https://certification.acsm.org/acsm-certified-personal-trainer, 2017), [c]AFFA-PFT The Aerobics & Fitness Association of America - Personal Fitness Trainer, (https://www.afaa.com/ courses/ personal-fitness-trainer, 2017), [d]CI-CPT The Cooper Institute Certified Personal Trainer, (http://www.cooperinstitute.org/certified-personal-trainer, 2017), [e]NASM-CPT The National Academy of Sports Medicine Certified Personal Trainer (https://www.nasm.org/how-to-become-a-personal-trainer, 2017), [f]NFPT-CPT National Federation of Personal Trainers Certified Personal Trainer (https://www.nfpt.com/certification, 2017), [g]NPTI-CPT National Personal Training Institute Certified Personal Trainer (https://nationalpti.edu/training-programs/admission-requirements/, 2017), [h]NSCA-CPT The National Strength and Conditioning Association Certified Personal Trainer (https://www.nsca.com/ personal-trainer-exam-prerequisites/, 2017),

As demonstrated in Table 1 even among accredited organizations, the requirements for certification vary. Common minimum requirements among accredited certifying organizations include the following; the trainer must be at least 18 years old, a high school graduate, and have a current CPR certification. The National Personal Training Institute Certified Personal Trainer (https://nationalpti.edu/training-programs/admission-requirements/, 2017) also requires six months of in-person learning in addition to the aforementioned requirements. Some personal training certifications, such as the Cooper Institute, The Aerobics & Fitness Association of America and The National Academy of Sports Medicine do not require a high school diploma or GED. The American College of Sports Medicine, National Federation of Personal Trainers and The National Strength and Conditioning Association all offer optional in-person learning at an additional cost. No organization that certifies personal trainers currently requires a bachelor's degree to be eligible to sit for examination. It is not known if these different pathways to entry in the profession may affect the knowledge level, skills or professional success of personal trainers.

The ability of personal trainers to improve physical inactivity and health outcomes may be dependent on factors such as educational training, certification and knowledge or skills. Because no singular educational standard is required for personal trainers to enter the profession it is difficult to assess which factors may impact the effectiveness and skills of personal trainers.

To date, limited research has examined whether the type of preparation for becoming a personal trainer affects personal trainers' knowledge, skill set, trainer-client interactions, client retention rates, or client outcomes. Developing a better understanding of what factors may influence client retention rates will allow personal trainers to increase their influence on public health outcomes. That is, enhanced client retention may lead to greater adherence to exercise participation and improved health outcomes. This study was an initial step in the process toward better understanding the best ways to prepare personal trainers to fulfill this role. The purpose of this study was to investigate associations between educational attainment, personal training certification acquisition, and knowledge scores of personal trainers and client retention. The Specific Aims of the study were as follows.

Specific Aim 1: To examine the associations between education, credentials of personal trainers and years of experience as a personal trainer with knowledge of exercise science and personal training principles.

We hypothesized the following:

1. There will be no association between education levels of personal trainers and knowledge.
2. There will be no association between an individual certification obtained by personal trainers and knowledge.
3. There will be no association between two or more certifications obtained by personal trainers and knowledge.
4. There will be no association between years of experience and personal trainer knowledge.
5. Higher levels of education, a single personal training certificate, multiple personal training certificates, or a combination of education and personal training certificate(s) will not be associated with knowledge after controlling for confounding variables.

Specific Aim 2: To examine associations between education, credentials, years of experience and knowledge of personal trainers with client retention.

We hypothesized the following:

1. There will be no association between education levels of personal trainers and client retention.
2. There will be no association between an individual certification obtained by personal trainers and client retention.
3. There will be no association between two or more certifications obtained by personal trainers and client retention.
4. There will be no association between years of experience and personal trainer knowledge.

5. Higher levels of education, a single personal training certificate, multiple personal training certificates, and years of experience will not be associated with client retention after controlling for confounding variables.

This was an exploratory investigation intended to begin the process of better understanding the best ways to prepare personal trainers for the profession.

Limitations

This study used a cross-sectional study design, which did not allow for temporal sequence or cause and effect to be determined. A cross-sectional design also does not allow one to rule out confounding variables. Because we did not collect survey data from the clients of the personal trainers, we do not have any information about why clients stopped using the services of the personal trainer. We are aware that the personal training clients are half of the formula that makes up the personal trainer/client relationship and the decision to stop utilizing the services of a personal trainer may have nothing to do with characteristics of the personal trainer. For example, time, finances or reaching one's goals may be reasons why clients stop using the personal trainer that are independent of the trainer's skills. Survey data from the clients would have added clarity to our study. However, we were unable to collect that data for this study.

Delimitations

Not collecting retention data from the clients of the personal trainers was the primary delimitation of this research. Retention data from clients of personal trainers, would have allowed for the investigation of the reasons why they decided to continue or discontinue personal training sessions and would have added clarity on client retention. However, collecting data from both personal trainers and clients was beyond the scale of a typical Thesis project. Data from the clients would have to be linked to the personal trainers and obtained prospectively. Additionally, the survey would not have been anonymous which would have required acquiring consent from each of the clients. We would have needed to link the client with the personal trainer data if we used this approach. Ultimately, we decided against this approach based on the time and resources necessary to conduct such research.

Definitions

Personal Trainer - Personal trainers were defined as fitness professionals involved in exercise prescription and instruction in only a one-on-one setting.

Client Retention - Client retention was defined as the total number of weeks that a client has participated in training with a personal trainer.

Personal Trainer Knowledge - Knowledge was a continuous variable that was determined by the correct number of answers on a 24-question survey.

CHAPTER 2

LITERATURE REVIEW

Personal Training and the Health and Fitness Industry

Scientific research has clearly demonstrated that exercise and PA are beneficial in reducing the risk of coronary artery disease, stroke and some forms of cancer, including breast cancer, colon cancer and prostate cancer (Haskell et al., 2007; Kesaniemi et al., 2001; Wenger et al., 1995). Exercise is beneficial for managing obesity and Type II Diabetes (Zaccardi et al., 2015). Additionally, exercise can help control blood pressure (Hegde & Solomon, 2015) and blood lipid levels (Hung et al., 2015). In recent years, sedentary behavior has been included as an independent risk factor for heart disease and stroke (Menai et al., 2015). Some experts suggest that being sedentary is as detrimental to overall health as is smoking cigarettes (Thyfault, Du, Kraus, Levine, Booth, 2015).

Despite the well-established benefits of exercise and numerous public health guidelines recommending regular participation in moderate to vigorous PA on most days of the week and strength training on at least two days per week, (Pescatello, L., & ACSM, 2014) exercise participation rates remain sub-optimal. There is still a high percentage of inactive adults with 33% of the U.S. population reporting no leisure time PA (Pleis, J. R., Lucas, J. W., & Ward, B. W., 2009) and less than 10% meeting the current PA guidelines when measured objectively using accelerometry (Tucker, J. M., Welk, G. J., & Beyler, N. K., 2011).

A substantial number of individuals join health and fitness facilities or gyms to become more active. According to the International Health, Racquet, and Sports Clubs of America (IHRSA) there were 52.9 million American health club members in 2015 representing 21.3% of the U.S. adult population (www.ihrsa.org/consumer-research/). Of those 52.9 million, 23.2 million were "core" members, or members who used the club at least 100 times a year and 8 million people used the services of a personal trainer in 2015. (www.ihrsa.org/consumer-research/). While the use of a personal trainer by 8 million people only represents 2.5% of the United States population, (United States Census, 2017), it is equivalent to 15.1% of all gym members or 34.4%

of what IHRSA has defined as a "core" member. This data suggests people who use health and fitness facilities are seeking the services of personal trainers. Moreover, there may be an association between frequency of gym use and the use of personal trainers implying that personal trainers may play a role in consistency of exercise participation.

Over the past two decades, the fitness industry has grown substantially. According to U.S. Fitness Center statistics, health and fitness club membership has grown from 32.8 million in 2000 to 54.1 million in 2014 (US Fitness Center, 2015). Paralleling this growth is an anticipated job growth for personal trainers. According to the United States Bureau of Labor Statistics there were 299,200 personal trainers in the United States in 2016 (http://www.bls.gov/ooh/personal-care-and-service/fitness-trainers-and-instructors.htm). It is estimated this number will increase by 10% between 2016 and 2026, adding an additional 30,100 personal training jobs by 2026. As more people use health and fitness clubs and seek the services of personal trainers, an opportunity exists for the profession to address physical inactivity and potentially improve health outcomes.

Despite the recent growth of the fitness industry and the continued expansion of the body of knowledge of the exercises sciences there has been a simultaneous increase in the prevalence of chronic diseases in the United States (Bauer, Briss, Goodman, & Bowman, 2014). Personal training services should continue to be an option for individuals who are interested in addressing physical inactivity and associated chronic diseases. This type of role for personal trainers could be beneficial to the overall health care industry, because a preventative approach to managing health may result in an overall decrease in healthcare costs (Cecchini, 2015).

In addition to opportunities that exist for personal trainers to work with special populations and people with risk factors for cardiovascular disease, personal trainers also work with seemingly healthy clients. The personal trainer's clientele can be diverse, and may include those who have goals related to athletic performance, feeling better, stress management or physique transformation. Personal trainers need to have a broad skill set to accommodate the potential diverse needs and goals of their clients. The ability of personal trainers to improve physical

inactivity and health outcomes as well as work with apparently healthy adults may be dependent on factors such as educational training, certification and knowledge or skills. To date there is no singular educational standard required for personal trainers to enter the profession and this may affect the effectiveness and skills of personal trainers.

Personal trainers can earn their credentials and secure employment through numerous pathways. Obtaining an associate or bachelor's degree in a kinesiology or exercise science related subject is a common pathway for becoming a personal trainer but a college degree is not mandatory. Personal trainers can also obtain numerous different certifications to prepare for their career. The quality and rigor of these certifications vary, as do the qualifications to sit for certification.

To the best of our knowledge, no clear data exists on the percentage of personal trainers who have a bachelor's degree in an exercise science related subject. Survey data collected by (Schroeder, 2015) shows that 77% of employers consider a college degree as a criterion when making personal trainer hiring decisions. Likewise, 67% of employers considered a degree when making determinations related to compensation. Nearly 32% of employers considered a degree when making decisions about pay raises and 48% considered a degree as a criterion for promoting personal trainers. Findings also suggested employers considered certification 99% of the time when hiring, 82% of the time for compensation decisions, 52% of the time for raises and 59% of the time for promotion (Schroeder, 2015). This data suggest employers may find personal training certifications more important than a degree when making personnel decisions such as who is hired or promoted. To the best of our knowledge, data on the reasons why employers may prefer personal training certification to a degree are not available.

Personal trainers can select from a variety of options for obtaining a bachelor's degree. These options include a degree in Kinesiology, Biomechanics, Exercise Science, Exercise Physiology, Exercise and Wellness, Strength and Conditioning, among others. In general, attaining a bachelor's degree from an accredited college or university is relatively homogenous in terms of credit hours, time commitment, and depth of the subject matter. Most bachelor's degrees

require approximately 120 credit hours to complete. In comparison, the requirements for certification vary substantially. Some organizations providing personal training certifications are accredited through the National Commission for Certifying Agencies (NCCA) while other organizations providing personal training certifications are not NCCA accredited.

The ability of personal trainers to improve physical inactivity and health outcomes may be dependent on factors such as educational training, certification and knowledge or skills. Because there is not any singular educational standard required of personal trainers to enter the profession it is difficult to assess which factors may influence the effectiveness and skills of personal trainers.

To date, limited research has examined whether the type of preparation for becoming a personal trainer affects personal trainers' knowledge, skill set, trainer-client interactions, client retention rates, or client outcomes. Developing a better understanding of which methods may enhance client retention rates will allow personal trainers to increase their influence on public health outcomes. This study was intended to begin the process of better understanding the best ways to prepare personal trainers to fulfill this role.

Personal Trainer and Client Retention

In December of 2015 an initial literature review was conducted, using both the PubMed and CINAHL databases and the search term "Personal Trainer and Client Retention". Using the search term "Personal Trainer and Client Retention" with both PubMed and CINAHl failed to find any evidence of research on the topic of personal training and client retention. Using the ABI/INFORM database, a business industry data base and the search term "Personal Trainers and Client Retention", resulted in 480 peer-reviewed journal articles. After reviewing the abstracts, it was determined that zero of the 480 articles were related to the personal training profession.

To verify that research had yet to be conducted on this topic an additional literature review was conducted in May 2017. Using the same search term, "Personal Trainer and Client Retention" and PubMed, CINAHL and Google Scholar as data bases resulted in the identification

of seven scientific journal articles. It was determined after a review of those seven articles that all of them were related to the Certified Athletic Training profession and not personal training.

In May, 2017, using Google Scholar as a database and the search criteria of "Personal Trainer" OR "Personal Training" AND "Client Retentions" OR "Customer Retention" resulted in 150 potential sources. After reviewing the abstracts of those 150 sources it was determined that one article might be relevant for this study. That study was a thesis titled "A Systematic Analysis of Personal Training Client Retention Rates for Sport and Health, Crystal Park" (Keenan, R., 2015). Despite the potential of the title being a relevant source, Keenan, R., (2015) determined that the sample size (n=9) was insufficient to determine an accurate measure of client retention and therefore didn't report any statistical data on client retention.

Another search in May, 2017 and using the business related database ABI/Inform and the search term "Personal Trainer and Client Retention", resulted in the identification of zero scientific studies. The search term "Personal train?" AND "Client Retention" OR "Customer Retention" AND Fitness resulted in the identification of 331 sources. After a review of those 331 sources it was determined that none of them were related to the intended search criteria of personal trainers and client retention. One article, however, was related to customer loyalty at sport and fitness centers (Avourdiadou, S., & Theodorakis, N. D., 2014). The identification of this research on customer loyalty in the fitness industry triggered an additional search on member retention in health and fitness clubs. Because of the paucity of research on personal training and client retention it was determined that an attempt to further understand member retention in the fitness industry might serve as a proxy for this research.

Health Clubs and Member Retention

A search of the ABI/INFORM database in May, 2017 using the term "Health Clubs and Member Retention" and limiting the results to peer-reviewed journals resulted in 1,538 sources. After a reviewing the abstracts, five articles were determined to be relevant to the Health and Fitness Industry and member retention. Also in May, 2017, and utilizing the ABI/INFORM database and the search terms "personal train?" AND "client retention" OR "customer retention"

AND fitness, a search resulted in the identification of 331 peer reviewed articles. A review of the abstracts of those 331 articles resulted in the identification of one additional source related to health clubs and member retention. In total six studies were identified related to member retention in the fitness industry.

The six studies identified on the topic of member retention in the fitness industry varied in the approach used to assess member retention. Hurley, (2004) assumed that retention marketing (RM) strategies that are effective for customer retention in other retail and service industries (Gronroos, 1990; Reichheld, 1994; & Borna, 2000) would also be effective in the health and fitness industry. In (2012) Surujlal & Dhurup conducted a study to examine what type of strategies were used in South African health and fitness facilities to address customer retention. While Tsitskari & Tsakiraki (2014) surveyed 198 members of fitness facilities in the Greek City of Komotini to determine if "involvement" in exercise is related to customer satisfaction or dissatisfaction. Tsitskari & Tsakiraki (2014) contend that satisfied customers will be more loyal, therefore improving retention and profitability. In (2007), Lagrosen & Lagrosen published a study that utilized a grounded-theory approach to conduct interviews at fifteen health and fitness facilities in Sweden to examine service quality in health and fitness facilities.

Wei et al. (2010) determined that a positive relationship between customer satisfaction and brand or customer loyalty exists. Customer loyalty is linked to the likelihood of a return customer. In the case of health and fitness clubs, customer loyalty means an improved likelihood of membership renewal. The researchers surveyed 50 members from four San Francisco area fitness facilities.

In (2013), Yee, W. M. W., Yeung, R. M., & Ma, L., investigated possible drivers of customer satisfaction in the fitness club industry. The four primary drivers of customer satisfaction examined were; psychological factors, physical environment, service environment and a two-way interaction. The researchers recommend that the fitness industry utilize knowledgeable, well-trained, customer-oriented employees and provide high quality services to maintain or improve customer satisfaction (Yee, W. M. W., Yeung, R. M., & Ma, L., 2013).

To date, the research on member retention at health and fitness facilities references customer retention in other industries and assumed that the same factors will apply to the fitness industry. In general, the findings do support the premise that what is important relative to customer satisfaction, is also important to satisfaction of health and fitness club members. What is missing in the literature is whether the implementation of member retention strategies affects member retention in the health and fitness industry.

Wei et al (2010) determined that the three categories that most strongly influence membership renewal are, in order; staff interaction with members, size of the facility, and professional knowledge of the staff. Lagrosen & Lagrosen (2007) determined that relational competence and technical competence were the main enablers that influence the three quality dimensions related to customer satisfaction. Relational competence is the personal interaction of the staff with members and technical competence is the knowledge and ability of the staff to provide instruction or service.

Wei et al., (2010), Lagrosen & Lagrosen (2007) and Yee, W. M. W., Yeung, R. M., & Ma, L., (2013) found that staff knowledge is a contributing factor to customer satisfaction and potential member retention rate in the health club and fitness industry. The suggestion that staff knowledge may be important in member retention raises the question; is knowledge important in the retention of clients for personal trainers?

Staff Knowledge and Member Retention

While reviewing the literature on the possible relationship between educational level and personal training credentials and client retention, an underlying assumption developed, the knowledge acquired during the credentialing process might make a difference in the experience of the client. In other words, does personal trainer knowledge influence the client's experience and ultimately client retention? As this question developed during the initial literature review an additional review was conducted using the search term "personal trainer knowledge". Using CINAHL database and searching the term "personal trainer AND knowledge 74 total studies were

identified in May of 2017. After a review of the abstracts, four articles were determined to be relevant to the topic.

Melton & Mustian (2008) conducted focus group interviews to identify the skills and qualities that practicing exercise leaders thought were necessary to be a successful personal trainer. Eleven certified personal trainers, ranging in age from 22-50 years with 4-9 years of experience in the field were interviewed. Nine of the eleven personal trainers had a college degree, and all were certified.

Melton & Mustian (2008) identified four global themes: (1) client selection rationale, (2) client loyalty, (3) credentials, and (4) negative characteristics. Client selection rationale are the factors that influence a client's initial selection of a trainer. Those factors include; the appearance or physique of the trainer, gender and race, niche (trainer's area of expertise) and referrals from a trusted source. Client loyalty are the traits of the trainer that affect the client's decision to continue training. Those traits include; motivational skills, individuality (ability to make the client feel unique and cared for), empathy and good social skills. Credentials include education level, specifically a college education and certifications held by the personal trainer. Negative characteristics are traits or behaviors that lesson the possibility of a successful career. The negative traits include unethical behavior such as sexual comments or inappropriate touching and unprofessional behavior such as selling extra nutritional items solely for extra income, not paying attention to clients, poor punctuality, etc.

The primary concern expressed by the personal trainers interviewed for this study was the potential consequence of low-quality exercise leaders practicing in fitness facilities and the subsequent effect this may have on the consumer. Perceived consequences of the low-quality exercise leaders included; a lack of proper instruction, a negative PA experience for the clients, injury to the clients, and negative health effects associated with low adherence (e.g., obesity prevalence).

Melton & Mustian (2008) suggest a need for future research on undergraduate programs and certification curriculums to include formal training in interpersonal skills and behavioral

strategies to increase motivation as well as a greater focus on application as opposed to theory. This call for more practical application is in alignment with major certifying organizations. Professional organizations agree that important personal trainer competencies should include not only basic scientific anatomy, biomechanics, and exercise physiology knowledge but also; lifestyle and health, chronic disease, exercise programming, program management, health behavior modification, and nutritional advice (ACSM, & Ehrman, J. K., 2010; Howell, J., & Minor, SL., 2000).

Zenko & Ekkekakis (2015) conducted a research survey focused on assessing the level of knowledge of the 2011 ACSM exercise prescription guidelines . The respondents of this survey were 1808 exercise professionals certified by the ACSM. Those surveyed included both men and women from all 50 states with a wide range of work experience and roles and educational levels from high school diploma to doctoral degree. The 11-item survey's intent was to assess the exercise professional's current level of knowledge of the ACSM guidelines. Also included in the survey were separate questions to assess the respondent's perceived level of knowledge and the knowledge that they feel is required to function properly as an exercise professional.

The mean score on the 11-item quiz was 4.72 ± 1.87 (42.87 ± 17% correct). Age, sex, and work experience were not associated with overall knowledge. The total number of certifications held by each individual did not have an effect on knowledge scores. However, educational attainment did have a significant effect on knowledge scores, with those achieving a higher education scoring better; from 38.72 ± 1.62% for "some college" to 47.01 ± 1.71% for "Doctorate." There were also significant differences for the primary job role, with those who identified as 'personal trainers' scoring the lowest (40.59 ± 1.66%), while clinical exercise physiologist scored the highest (44.18 ± 1.7%). The highest score was for a question that assessed knowledge of a variable that has remained constant for years (e.g., the value of a MET, 78.6%), while the lowest scores occurred on variables that have changed or been updated constantly (e.g., intensity ranges of exercise, 13.5%). Most respondents noted that their primary source of information was scientific sources (~70% of sample). Respondents who reported using

scientific sources as their primary source of information scored significantly higher (43.93%) than those who reported using non-scientific sources as their primary source of information (e.g., websites, blogs, magazines, etc., (40.33%), ($F_{1,1806} = 17.00$, $p < 0.001$).

In (2013) De Lyon & Cushing investigated the ways in which fitness trainers acquired and developed knowledge. The authors also investigated the fitness trainers' perception on how this acquisition of knowledge related to their professional practice. The study included 11 fitness trainers from the United Kingdom. The participants were, seven men and four women between the ages of 21 and 42 years, and with 1-15 years of experience working as a fitness trainer as their main occupation. All subjects were registered with an international registry which required at least a bachelor's degree in exercise science or kinesiology and at least six-months of work experience as a personal fitness trainer for eligibility.

The researchers used a qualitative study design to answer the study's overreaching question "How do fitness trainers acquire and develop knowledge and perceived this in relation to their professional practice?" Interviews were conducted with the study participants. Patterns and themes were identified from the perspectives of the interviewed participants. The findings were organized into three higher order themes: formal, non-formal, and informal learning.

De Lyon & Cushing (2013) referenced the previous work of Coombs and Ahmed (1974) for the definitions of formal, non-formal and informal learning. According to Coombs and Ahmed (1974), formal learning is something that takes place in an "institutionalized, chronologically graded and hierarchically structured educational system." De Lyon & Cushing (2013) further subdivided formal learning into three subthemes: Register of Exercise Professionals (REPs) level, perceptions of degree courses, and perception of course assessment methods. Informal learning is "the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes, and insights from daily experiences and exposure to the environment." (Coombs & Ahmed, 1974). De Lyon & Cushing (2013) divided the theme of informal learning into 6 subthemes: learning on the job, influence of the (fitness) environment, learning from others, developing social skills, self-directed research, and trial and error learning. Non-formal learning is

“any organized, systematic, educational activity carried on outside the framework of the formal system to provide select types of learning to particular subgroups in the population” (Coombs & Ahmed, 1974). De Lyon and Cushing (2013), divided the theme of non-formal learning into 2 subthemes: Continued Professional Development (CPD) courses and barriers to CPD courses.

The results of this study suggested that fitness trainers learn in multiple and complex ways, many of which are informal and often occur within the context of their everyday work. The researchers found that fitness trainers acquired their knowledge from a variety of sources and through various pathways; formal education (degree and continuing education); informal learning (learning through practical experience), as well as non-formal learning (self-directed research). The study also found that a work environment that encourages continuing education and professional development might also be important to the continuation of knowledge development. An important finding from this study was that most learning occurred informally, beyond dedicated formal training environments. The study concluded that there is a need for an improved integration between the current formal (REPs) accreditation system and informal knowledge which is developed while working as a fitness trainer.

De Lyon & Cushing's (2013) study suggested that disparities exist between the knowledge accredited fitness trainers acquire during their formal education and the knowledge later used during their professional practice. This finding is in alignment with positions held by some of the major certifying organization that also recognize potential disparities between formal education and daily job requirements and called for a more practical application of the exercise science information (ACSM, & Ehrman, J. K., 2010; Howell, J., & Minor, SL., 2000).

In (2002) Malek, et al., conducted research to examine the relationship between years of professional fitness training experience, education, and professional certification credentials and actual fitness training knowledge. The authors of the study created a 48-question survey deemed the Fitness Instructor Knowledge Assessment (FIKA$^{(c)}$) to examine relations between commonly used indicators of knowledge in the five areas of (a) nutrition, (b) health screening, (c) testing protocols, (d) exercise prescription, and (e) general training knowledge regarding special

populations. The reliability of the questionnaire was assessed by administering it to graduate students, fitness professionals, and exercise physiologists. Participants in the study were 115 health fitness professionals (61 men and 54 women), aged 20-54, from the Los Angeles, CA area. These professionals were from 28 different facilities (independent gyms, large fitness chains, colleges, and/or self-employed). Forty-three of the participants had 5+ years of fitness industry experience while 73 had less than 5 years of experience. Twenty-two of the study's participants had a Bachelor's degree or higher in Kinesiology, while 93 had less than a Bachelor's degree. Sixty-eight of the participants had completed 4 or more core courses while 47 had completed less than four core courses. While all participants held a personal training certification only 11 held certifications from either ACSM or NSCA

Individuals with at least a bachelor's degree in exercise science scored higher on all FIKA scales than individuals who did not hold a bachelor's degree in exercise science (68% vs. 37%). Those individuals who had taken at least four of the core courses recommended for a competent health fitness professional scored significantly higher than those who had completed three or fewer courses (61% vs. 36%). Individuals that were certified by ACSM and/or NSCA scored significantly higher on the FIKA questionnaire than those who were not certified by either (83% vs. 38%).

Respondents who had completed a bachelor's degree or higher and held a certification from either ACSM or NSCA scored an average of 85% compared to those who did not have a degree and were certified by other organizations who scored an average of 36%. Those fitness professionals with either a bachelor's degree or an ACSM/NSCA certification scored an average of 55%. There was no association between years of work experience and knowledge. When all four predictors were entered into a regression model 63% of the knowledge demonstrated on the FIKA questionnaire could be accounted for by having a bachelor's degree in exercise science and having a certification from either ACSM or NSCA.

Malek et. al.(2002), concluded that despite the fact that many in the health fitness industry believe that practical experience is key, the results of this study show that formal

education is a far better predictor of personal trainers' health and fitness knowledge than years of experience. Additionally, ACSM or NSCA was associated with much higher levels of health fitness knowledge than certification by any other certifying organizations, or even certifications from several other certifying organizations. The authors suggested that personal fitness trainers should have licensing requirements, such as a bachelor's degree in exercise science and certifications by an organization whose criteria are extensive and widely accepted, before they can practice their profession. While these studies suggest that a relationship exists between education and certain certifications and knowledge survey scores, to date no research has been identified that investigated if a relationship exists between knowledge scores and client retention.

Therefore the purpose of this study was to investigate the relationship between educational attainment, certifications acquired, years of experience and knowledge scores of personal trainers and client retention.

CHAPTER 3

METHODS

Research Design

This study utilized a cross-sectional research design. Data was collected via an anonymous electronic survey with a goal of investigating what, if any, relationship exists between the educational level and/or certification of personal trainers, knowledge, years of experience and client retention. Participation in this study was voluntary and all complete surveys from personal trainers currently working with one-on-one clients were included.

The landing page of the electronic survey was an informed consent page. See Appendix G for the informed consent form. Participants were required to acknowledge and agree to the terms of the Informed Consent before they could continue to the first question of the survey. The survey was 63 questions in length. Completion time varied dependent upon the number of clients the personal trainer had at the time of the survey. The Human Subjects Institutional Review Board at Arizona State University (ASU) approved this study. See Appendix E for ASU's IRB approval letter.

Participants

Participants for this study were individuals who self-identified as a currently employed personal trainer. For this study, we defined personal trainers as fitness professionals involved in exercise prescription and instruction in a one-on-one setting. According to the US Bureau of Labor Statistics there were 299,200 personal trainers in the US in 2016 (http://www.bls.gov/ooh/personal-care-and-service/fitness-trainers-and-instructors.htm). The US Bureau of Labor Statistics did not differentiate between certified and non-certified personal trainers. For this study, both certified and non-certified personal trainers, who self-identified as currently working in the profession were included. Individuals had to be at least 18 years of age to participate in the study. Former personal trainers, including those with a current certification were excluded from the study. Fitness professionals who were not currently employed as personal trainers were also excluded from the study. Exercise and fitness professionals that were excluded included, but

were not limited to; group fitness instructors, yoga instructors, Pilates instructors and cardiac rehabilitation professionals unless they were also currently employed as a personal trainer.

Recruitment/Sample Size

Personal trainers were recruited via the internet and through word of mouth. Numerous online indexes were utilized to contact and recruit personal trainers for this study. Those indexes included; IDEA Health and Fitness Association, United States Registry of Exercise Professionals (USREPS), American Council on Exercise (ACE), American College of Sports Medicine (ACSM), National Strength and Conditioning Association (NSCA) as well as several fitness professional and personal training groups on the LinkedIn website. We contacted department chairs of exercise science/kinesiology programs at universities and colleges, asked them to disseminate a link to the online survey to both current students and alumni. Additionally, we contacted large fitness chains and companies that contract out to personal trainers and requested they distribute the survey to their employees.

All data were collected via electronic survey. Qualtrics online survey software was used to develop the survey. See Appendix A for the complete survey. The sample size was (226). To determine significance from the data, a sample size of 385 personal trainers was needed. That sample size goal was determined utilizing an online sample size calculator (Creative Research Systems http://www.surveysystem.com/sscalc.htm) with confidence level set at 95% and a confidence interval of 5.

Variables

The dependent variable for Specific Aim 1 (To examine associations between education and credentials of personal trainers and knowledge) is knowledge. Knowledge is a continuous variable that was determined by the correct number of answers on a 24-question survey. The knowledge portion of the survey was developed specifically for this study using existing questions from practice exams of organizations who routinely certify exercise professionals. The knowledge portion of the survey was designed to assess shared KSA's (Knowledge, Skills and Abilities) from four well-recognized organizations that certify personal trainers, American Council on Exercise

(ACE), American College of Sports Medicine (ACSM), National Academy of Sports Medicine (NASM), and National Strength and Conditioning Association (NSCA). The criteria used to select the knowledge questions for the survey is detailed later in this Methods chapter. The independent variables for Specific Aim 1 (To examine associations between education and credentials of personal trainers and knowledge), are education level and type, and personal training certification credentials and years of experience.

The dependent variable for Specific Aim 2 (To examine associations between education, credentials and knowledge of personal trainers with client retention) is client retention. In the present study client retention is defined as the total number of weeks that a client has participated in training with a personal trainer.

The independent variables for Specific aim 2 (To examine associations between education, credentials and knowledge of personal trainers with client retention) are education level, personal training certification credentials, knowledge score and years of experience.

Confounding Variables

Multiple confounding variables that had the potential to affect the relationship between independent and dependent variables (client retention) for Specific Aim 2 were identified. The survey included questions to control for as many of the known confounding variables as possible. Potentially confounding variables with client retention included; sex of the trainer, cost of the training sessions, socioeconomic status of the client, years of experience of the personal trainer, and the type of facility where the personal training sessions occur.

Measurement:

Dependent Variables

Knowledge was assessed via responses to a 24-item survey developed specifically for this study. The knowledge portion of the survey was developed after analyzing the Knowledge Skills and Abilities (KSA's) required of personal trainers from four well-recognized certification organizations (ACE, ACSM, NASM, and NSCA). This analysis resulted in the identification of six general subject areas that are common to all four certification organizations: (1) Interviews,

Consultations, Assessments and Risk Appraisal, (2) Anatomy, Physiology, Basic and Applied Sciences, (3) Program Design and Planning, (4) Nutrition, (5) Communication, Goal Setting and Behavior Modification (6) Scope of Practice, Professional Conduct, and Emergency Procedures.

We purposely sought out permission from ACE, ACSM, NASM and NSCA to use questions from the practice exams for the CPT certification from each respective organization to enhance the validity of the study. We obtained permission from the American College of Sports Medicine, American Council on Exercise and the National Strength and Conditioning Association to use up to 12 questions from each of the certifying organization's practice exam on the survey but we were unable to obtain similar permission from NASM. The research team perceived these questions would be a better representation of the knowledge expectations for personal trainers and a more valid assessment of knowledge than creating questions on their own. Using questions from multiple organizations may also reduce bias in outcomes from individuals certified by any one organization.

While developing the knowledge portion of the survey, we intended to select one question from the ACE, ACSM, NASM and NSCA practice exams for each of the six common KSA topic areas, respectively. That would have resulted in a total of 24 questions, four questions per topic area with one question per topic area representing each of the aforementioned organizations. Because we did not receive permission to use practice exam questions from NASM we varied the approach from our initial intent slightly. In total we selected seven ACE practice exam questions, six ACSM practice exam questions, and six NSCA practice exam questions. The graduate student conducting this Thesis and two of the committee members (CB and JV, with expertise in exercise physiology) wrote the remaining five questions based on subject matter and KSA's from NASM. An emphasis was made to include questions that were deemed general fitness industry and personal training related knowledge covered by all four organizations including NASM. An effort was also made with the selection of the final five questions to select topics that had not previously been assessed with the first 19 questions selected. Attempts were made to avoid questions that may be biased toward an individual

certifying organization. We also varied slightly in selected four questions for each major KSA topic area. We selected three questions for major KSA topic area(4) Nutrition and selected five questions for major KSA topic area (3) Program Design and Planning. We did select four questions each of the remaining four major KSA subject areas. Once individual questions were selected, they were matched to the topic area addressed along with the corresponding KSAs from the four-certifying organizations. That information is located in Appendix B. The actual questions from ACE and ACSM had to be redacted for copyright purposes.

The dependent variable, client retention, for Specific Aim 2 was measured by asking, 'In the past 30 days how many one-on-one personal training clients have utilized your personal training services? (Please do not include small group training clients).' After the survey participant selected a specific number of clients, four questions for each client repeated. Those questions were;

1. Enter client "X" initials
2. One average, how many times per week do you train client "X"?
3. What is the duration of each session with client "X'?
4. How long have you been training client "X"?

The participant then filled in how many "Weeks", "Months", or "Years" they have worked with each client. These four questions repeated for every client that the survey participant reported training. For this study, "Client Retention" was determined by the total number of weeks that a client has participated in training with a personal trainer. Weeks were determined by multiplying the number of years the personal trainer reported they worked with a client by 52. We then multiplied the number of months the personal trainer reported they worked with a client by 4.345 and summed those two products along with the number of weeks the personal trainer reported they worked with a client. We then summed the total number of weeks reported by the personal trainer for all clients and divided it by the number of clients to calculate the average weeks of client retention per personal trainer.

Independent Variables

All independent variables were assessed via the Qualtrics survey. The independent variables were measured as nominal data. Participants answered questions that categorized each personal trainer into distinct nominal groups. Educational level choices were less than a high school diploma, high school graduate or GED, attended some college, associate degree, bachelor's degree, master's degree, or doctoral degree. Participants who selected associate degree or higher, were prompted to answer additional questions to determine from which field of study they earned their degree. The first question was; "Is (or are any of) your college degree(s) in an exercise science related major?". Respondents that answered yes to this question were asked the follow-up question "Select all of your degrees that are in an exercise science related major (please do not select degree levels in which you have a degree in a non-exercise science major)", with the following options; N/A, associate degree, bachelor's degree, master's degree, and doctoral degree.

Survey questions regarding certification followed the questions on education levels. The first question was, "Are you currently certified as a personal trainer? (Please do not include group exercise, yoga, Pilates, or other certifications when answering this question)". The second question was, " Please identify the professional organization(s) through which you currently hold the certified personal trainer credential (please consider only the certified personal trainer CPT level credential for this question and select all that apply)". A list of all currently accredited organizations as well as an option of "N/A" and "Other" (with a text box). Respondents were able to select all applicable options. See Appendix F for a complete list of the personal training certification options that were presented. Participants were then asked to identify any certifications that they've previously held but have since expired. Respondents that answered "no" to the question of being certified were directed to this same question; "Have you previously held a personal training certification?".

Participants were then asked, "Do you have a certification other than CPT (e.g. NCSA CSCS or NASM PES)?" and were provided with the same list of accredited certifying

organizations. A text box was provided for each option so that the personal trainers could specify all credentials held for each organization. To assess years of personal training experience participants were asked the following question; "How long have you been a personal trainer?". The participants filled in the number of “Years" and "Months" of personal training experience they have had to date. Years were converted to months by multiplying by 12 and adding that product to the number of months reported.

Covariates

We asked additional questions in the survey to assess covariates and/or confounding variables which might have been association with client retention. The personal trainers were asked to provide the ZIP Code for the location where they are employed as a personal trainer to evaluate the socioeconomic status of the clientele. According to IHRSA (http://www.ihrsa.org/research-faqs/), travel time to a fitness facility does not extend beyond 10-12 minutes or 5 miles. US Census, median household income data was determined for each reported ZIP Code to control for personal trainers who work in a variety of economic environments.

Role delineation was assessed with the following question; "Which of the following best describes your current position?". The answer choices were (1) Employed by a business or corporation, (2) Independent Contractor, (3) Sole Proprietor (Own your own business, but have no employees or independent contractors), (4) Owner (Own your own business, but employ and manage employees and/or independent contractors), and (5) Other (with an associated text box).

To assess the diverse types of settings in which personal training might occur, the following question was included in the survey; "Which of the following best describes the facility where you train your clients?". The answer options were (1) A large regional chain health and fitness club, (2) An independent local health and fitness club (stand-alone), (3) A neighborhood gym, (4) A personal training studio, (5) In-Home personal training, (6) An outdoor setting and (7) Other, with an associated text box. We also assessed the size of the facility in which the personal trainer works to further evaluate the type of setting in which the personal trainer worked.

Specifically participants were asked,, "What is the size of the facility in which you train your clients?" The answer options were (1) Under 1000 square feet, (2) 1000-5000 square feet, (3) 5000-15,000 square feet (4) 15,000 - 30,000 square feet, (5) over 30,000 square feet.

Finally the question, "On average how much do you or your facility charge for a one-hour personal training session?" was included to assess the variable of cost of the service.

Statistical Analysis

All continuous data were assessed for normality using the Kolmogorov-Smirnov test in SPSS, by examining the skewness and kurtosis of the data and by examining normality plots. Descriptive statistics were used to evaluate sample characteristics. Mean and standard deviations, median and interquartile range [IQR] and frequency and percentages were reported for the sample characteristics. For normally distributed data, bivariate associations were examined with dependent t-tests, and one-way analysis of variance with Tukey HSD for post hoc analyses. Non-parametric statistics were used to examine bivariate associations for variables that were not normally distributed. Specifically the Mann Whitney U and Kruskal-Wallis tests were used for non-normally distributed variables.

All statistical analyses were performed using IBM Statistical Package for the Social Sciences version 25 (SPSS). Significance level was set at $\alpha = 0.05$ using a two-tailed p-value since our hypotheses were non-directional.

CHAPTER 4

RESULTS

The results chapter will be broken down into two sections. The first section will address Specific Aim 1, while the second section will address Specific Aim 2. Specific Aim 1 was to examine associations between education and credentials of personal trainers and knowledge of exercise science and personal training principles. It should also be noted that only 91 participants were included in analyses for Specific Aim 2 due to incomplete data collection on the client retention portion of the questionnaire. One hundred thirty-five individuals were removed from the data set due providing inadequate data on client retention. Therefore, a subset of data was used for analyses for Specific Aim 2.

Participant Characteristics for Specific Aim 1

See Figure 1 for participant flow through the study. A total of 270 participants opened the survey and the total sample size for analysis was 226. The main reasons why participants were lost were as follows: declined consent (n=2), not eligible (n=1), completed less than 50% of the survey (n=41).

Figure 1. Survey Participation Flow

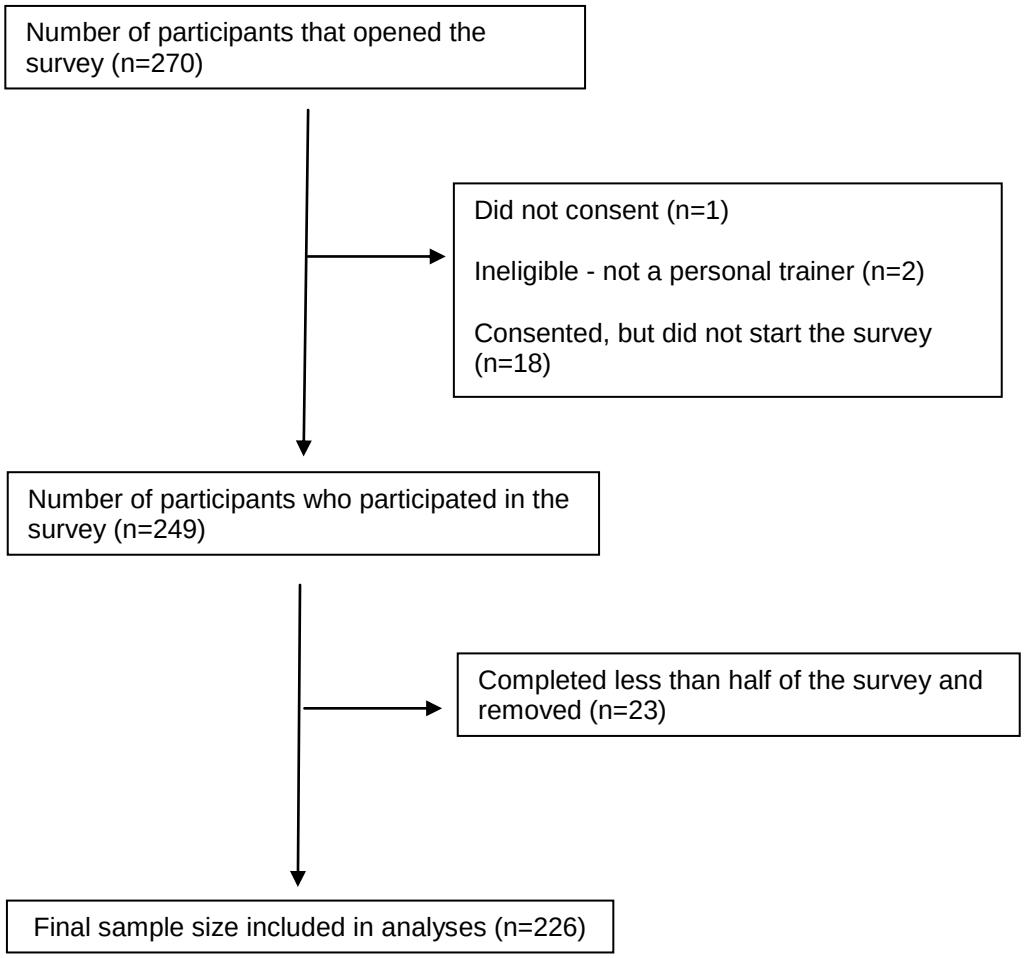

Table 2. provides an overview of the characteristics of the personal trainers who took part in the study by certification level and for the total sample. The mean age of the participants was 30.62 years with a standard deviation [SD] of 6.03. The majority of the participants were male (66.8%), had a bachelor's degree or higher (54.9%) and had earned a degree in an exercise-science related field (56.2%). Most participants were certified personal trainers (81.9%). The five most frequently reported certifications were; ACE (19.9%), IFPA (14.2%), NCSF (13.3%), AAPTE (11.9%) and NESTA (11.5%). See Figure 3 for the participants reported number of currently held and previously held personal training certifications (the total is greater than our sample, size n=226, because personal trainers were able to report on multiple certifications when applicable).

The median years of experience working as a personal trainer was 4.42 [IQR: 2.54] years, with a median of 4.61 [2.90] years for certified personal trainers and a median of 4.34 [2.65] for non-certified personal trainers. Personal trainers who were certified were older 31.34 [6.2] years than non-certified personal trainers 27.41 [3.7] years. A larger percentage of personal trainers (58.5%) who were not certified had an expired certification compared to certified personal trainers (44.9%). A larger percentage of certified personal trainers (45.9%) reported also being a certified group exercise instructor compared to personal trainers without a current certification (24.4%).

Figure 2. Current and Past Personal Trainer Certifications reported

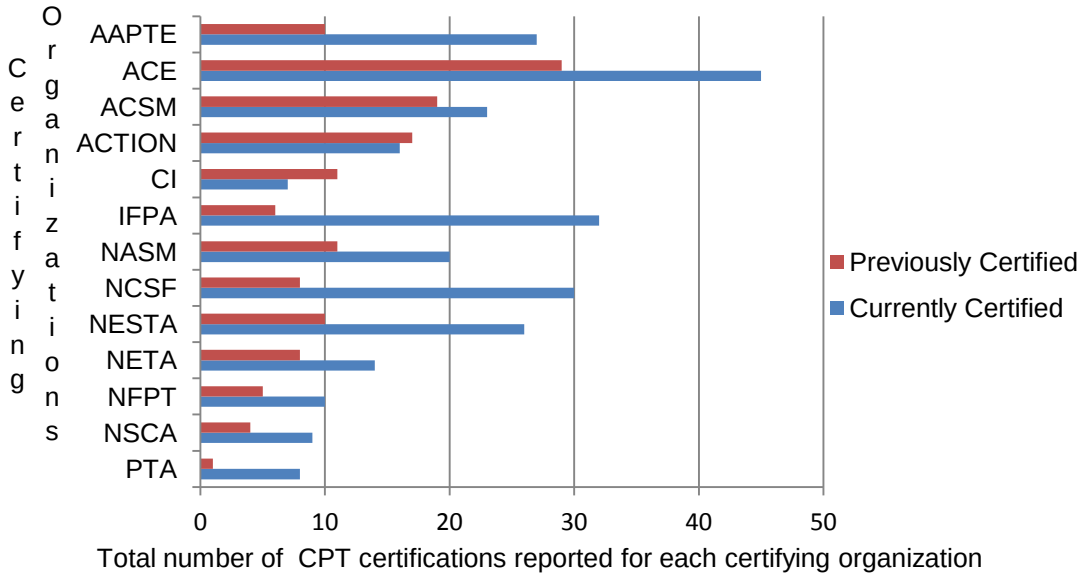

Table 2. Sample Characteristics by personal trainer certification status (n=226)

	Certified Personal Trainer	Non-Certified Personal Trainer	Total Sample
Age (avg. years)[a]	31.34 [6.2]	27.41 [3.7]	30.62 [6.0]
Sex (%)			
Male	126 (68.1)	25 (61.0)	151 (66.8)
Female	59 (31.9)	16 (39.0)	75 (33.2)
Education Level (%)			
Associate's Degree or lower	78 (42.2)	24 (58.5)	102 (45.2)
Bachelor's Degree	80 (43.2)	16 (39.0)	96 (42.5)
Master's Degree or higher	27 (14.6)	1 (2.4)	28 (12.4)
Exercise Science Degree (%)			
Yes	110 (59.5)	17 (41.5)	127 (56.2)
No	75 (40.5)	24 (58.5)	99 (43.8)
Exercise Science Degree Type (%)[b]			
Associate's Degree			
Bachelor's Degree	28 (25.7)	0 (0)	28 (22.4)
Master's Degree or Higher	62 (56.9)	7 (43.8)	69 (55.2)
Multiple Degrees	9 (8.3)	9 (56.3)	18 (14.4)
	10 (9.2)	0 (0)	10 (8.0)
Certified Personal Trainer (%)			
Yes			185 (81.9)
No			41 (18.1)
Expired Personal Trainer Certification (%)			
Yes	83 (44.9)	24 (58.5)	107 (47.3)
No	102 (55.1)	17 (41.5)	119 (52.7)
Group Exercise Certification (%)			
Yes	85 (45.9)	10 (24.4)	95 (42.0)
No	100 (54.1)	31 (75.6)	131 (58.0)
Years of Experience	4.61 [2.90]	4.34 [2.65]	4.42 [2.54]

	Certified Personal Trainer	Non-Certified Personal Trainer	Total Sample
<3 years	45 (24.3)	10 (24.4)	55 (24.3)
3-5.99 years	95 (51.4)	23 (56.1)	118 (52.2)
6-9.99 years	33(17.8)	7 (17.1)	40 (17.7)
10 or more years	13 (6.5)	1 (2.4)	14 (5.8)

[a]Certified personal trainers were significantly older than non-certified personal trainers ($t_{96.9}$ =3.88 p 0.024) ;
[b]Total is 125 and only includes individuals who reported they had an exercise science related degree.

Table 3. provides an overview of the employment characteristics of the participants. Of the personal trainers surveyed, 67.2% (n=139), worked at either a regional or national chain or an independent local health club and 53.4% (n=110) reported working as corporate employees. More than half of the personal trainers, 57.8% (n=119), reported working in a facility between 5000-15,000 square feet. Sixty-five percent of personal trainers (n=110) reported they or their employer charge a fee of $50 or less for a sixty-minute personal training session. The mean number of hours per week personal trainers reported working as a personal trainer was 31.17 hours (SD=12.07).

Table 3. Sample Characteristics employment variables

	Mean [SD]	Frequency n (%)
Number of hours worked/week	31.17 [12.07]	
Employment Status (n=206)		
Corporate Employee		110 (53.4)
Independent Contractor		52 (25.2)
Sole Proprietor		36 (17.5)
Owner		8 (3.9)
Type of Facility (n=207)		
Regional or National Chain		72 (34.8)
Independent Local Health Club		67 (32.4)
Neighborhood Gym		32 (15.5)
Personal Training Studio		19 (9.2)
In-home Training		11 (5.3)
Outdoors		3 (1.4)
Other		3 (1.4)
Facility Size (n=206)		
Under 1000 square feet		15 (7.3)
1000 - 5000 square feet		45 (21.8)
5000-15,000 square feet		119 (57.8)
15,000 - 30,000 square feet		22 (10.7)
Over 30,000 square feet		5 (2.4)
Average hourly rate (n=169)		
$25 per hour or less		46 (27.2)
$26-$50 per hour		64 (37.9)
$51-$75 per hour		30 (17.8)
$76-$100 per hour		17 (10.1)
$100+ per hour		12 (7.1)

Table 4. provides an overview of the knowledge scores and the associations between personal trainer characteristics and knowledge levels. The knowledge scores were not normally distributed ($p < 0.001$). The median knowledge score for the sample was 6.0 [IQR, 3.00]. Nearly 92% of the sample scored 41.7% or lower (10 or fewer questions correct out of 24). Gender, education level, degree type and certification status were not associated with knowledge scores ($p > 0.05$). Similarly, there was no difference between the median knowledge scores of currently certified personal trainers 6.0 [3.00] and non-certified personal trainers 6.0 [3.00]. There was no association between number of certifications and knowledge score.

Years of experience in personal training was positively associated with knowledge scores ($H(3) = 9.280$, $p = 0.026$). Personal trainers with 10 or more years of experience (n=13), had a significantly higher mean rank (163.31) than personal trainers with less than 10 years of experience. Specifically personal trainers with less than 3 years of experience (n=52), with 3-6 years of experience (n=118) and 6-10 years of experience (n= 40) had mean ranks of 109.50, 106.97 and 113.97 respectively.

Table 4. Associations between personal trainer characteristics and knowledge scores.

Characteristic	Mean Knowledge Score [SD]	Median Knowledge Score [IQR]	Mean Rank	Test Statistic	Significance
Total (N=223)	7.21[3.615]	6.0 [3.00]			
Sex				U = 5512.0	p = 0.998
Male (n=149)	6.84 [2.82]	7.0 [2.50]	111.99		
Female (n=74)	7.97 [4.77]	6.0 [4.25]	112.01		
Education Level (n=223)				H(4) = 0.447	p = 0.978
High School Grad. or lower	6.25 [2.36]	7.0 [4.25]	110.13		
Some College	6.80 [2.59]	7.0 [3.00]	117.03		
Associate's Degree	6.63 [1.94]	6.0 [1.00]	108.60		
Bachelor's Degree	7.49 [3.98]	6.0 [3.00]	111.81		
Master's Degree or higher	8.19 [5.82]	6.0 [6.75]	110.81		
Exercise Science Degree (n=174)				U = 2774.0	p = 0.516
Yes (n=167)	7.07 [3.39]	6.0 [1.25]	85.52		
No (n=47)	8.09 [4.88]	6.0 [3.00]	90.98		
Exercise Science Degree Type (n=124)				H(3) = 6.174	p = 0.103
Associate's Degree (n=28)	5.86 [1.72]	6.0 [1.00]	48.21		
Bachelor's Degree (n=68)	7.06 [2.94]	7.0 [1.00]	66.85		
Master's Degree or Higher (n=18)	7.16 [3.19]	6.0 [4.75]	64.06		
Multiple Degrees (n=10)	9.50 [6.88]	7.0 [12.75]	70.15		
Certified Personal Trainer				U = 3451.5	p = 0.705
Yes (n=184)	7.20 [3.61]	6.0 [3.00]	112.74		
No (n=39)	7.31 [3.87]	6.0 [3.00]	108.50		
Number of CPT Certifications (n=223)				H(2) = 5.265	p = 0.072
0 (n=41)	7.24 [3.61]	6.0 [3.00]	107.63		
1 (n=115)	7.70 [3.98]	7.0 [2.00]	121.06		
2 or more (n=67)	6.36 [2.73]	6.0 [3.00]	99.12		
Years of Experience (n=223)[a]				H(3) = 9.280	p = 0.026
<3 years (n=52)	7.06 [3.57]	6.0 [3.00]	109.50		
3-5.99 years (n=118)	6.89 [3.21]	6.0 [3.00]	106.97		
6-9.99 years (n=40)	6.73 [2.32]	7.0 [3.00]	113.97		
10 or more years (n=13)	12.30 [6.27]	15.0 [11.0]	163.31		

Characteristic	Mean Knowledge Score [SD]	Median Knowledge Score [IQR]	Mean Rank	Test Statistic	Significance
Employment Status (n=205)				H(3) = 6.799	p = 0.079
Corporate Employee (n=110)	7.81 [3.88]	7.0 [2.00]	111.78		
Independent Contractor (n=52)	6.52 [2.72]	6.0 [3.00]	90.16		
Sole Proprietor (n=35)	7.51 [4.31]	6.0 [3.00]	100.77		
Owner (n=8)	5.50 [2.20]	5.5 [4.25]	75.50		
Type of Facility (n=206)				H(6) = 5.076	p = 0.534
Regional or National Chain	6.86 [3.62]	6.0 [2.00]	93.91		
Independent Local Health Club	7.56 [3.71]	6.0 [2.00]	108.05		
Neighborhood Gym	6.59 [1.86]	7.0 [2.00]	103.97		
Personal Training Studio	8.36 [4.97]	6.0 [5.00]	110.97		
In-home Training	8.18 [4.75]	7.0 [5.0]	111.55		
Outdoors (n=3)	6.33 [2.08]	7.0	101.00		
Other (n=3)	11.67 [5.13]	13	154.33		

[a]Denotes significant difference

Due to the relatively low knowledge score, we also examined the questions on which participants scored the highest and lowest. Table 5 provides a breakdown of the percentage correct for each question. Respondents scored highest (43.18%) on questions from KSA Topic area #1 - Interviews, Consultations, Assessments and Risk Appraisal. Personal trainers scored the lowest (15.08%) on questions from KSA Topic area #5 - Communications, Goal Setting, and Behavior Modifications.

Table 5. Subject, KSA Topic, and Correct Percentage Response for each Knowledge Question

Question #	Subject Matter	KSA Topic Area	Correct %
1 (ACE)	Open-ended questions	Interviews, Consultations, Assessments and Risk Appraisal	50.4
2 (NSCA)	Definition of a contract	Scope of Practice, Professional Conduct, Emergency Procedures	53.3
3 (ACSM)	Agreements, releases and consent forms	Interviews, Consultations, Assessments and Risk Appraisal	57.6
4 (NSCA)	Which is a short-term behavioral goal?	Communication, Goal Setting, Behavior Modification	29.1
5 (ACE)	Personal trainers' scope of practice	Scope of Practice, Professional Conduct, Emergency Procedures	14.7
6 (NSCA)	Short-term adaptation form resistance training	Anatomy, Physiology, Basic and Applied Sciences	32.6
7 (ACE)	Assessments with a client taking a beta blocker	Interviews, Consultations, Assessments and Risk Appraisal	31.4
8 (NSCA)	Intensities influence on energy systems during exercise	Anatomy, Physiology, Basic and Applied Sciences	57.4
9 (ACE)	Personal trainer's scope of practice	Scope of Practice, Professional Conduct, Emergency Procedures	26.0
10 (ACE)	Topic of postural screening	Interviews, Consultations, Assessments and Risk Appraisal	37.7
11 (ACSM)	Topic of negligence and an act of omission	Scope of Practice, Professional Conduct, Emergency Procedures	27.8
12 (ACSM)	Physiological responses to high ambient temperature	Anatomy, Physiology, Basic and Applied Sciences	34.2
13	Which option indicates that a client has implemented a SMART goal?	Communication, Goal Setting, Behavior Modification	9.0
14	Energy system at the start of exercise	Anatomy, Physiology, Basic and Applied Sciences	34.7
15 (ACSM)	Stages of motivational readiness	Communication, Goal Setting, Behavior Modification	18.9
16 (ACE)	Exercise selection for core and hip stability and hip mobility	Program Design and Planning, Special Populations	14.0

Question #	Subject Matter	KSA Topic Area	Correct %
17 (NSCA)	Macronutrient to prevent hypoglycemia during a race	Nutrition	19.8
18 (ACSM)	Topic of exercise prescription components	Program Design and Planning, Special Populations	49.5
19 (ACE)	Stages of the client-trainer relationship	Communication, Goal Setting, Behavior Modification	11.7
20	2008 PA Guidelines for Americans	Program Design and Planning, Special Populations	9.5
21	Rapid weight loss from a low carbohydrate diet	Nutrition	14.9
22 (NSCA)	Program design for a whole-body workout	Program Design and Planning, Special Populations	36.0
23 (ACSM)	Water soluble versus fat soluble vitamins	Nutrition	33.5
24	Appropriate exercise to enhance balance	Program Design and Planning, Special Populations	18.6

The mean number of clients the personal trainers indicated they trained was 5.23 (7.73). Personal trainers reported that they added a mean of 2.09 [2.133] new clients in the last 30 days and lost a mean of 0.99 [1.704] clients in the last 30 days. Personal trainers reported acquiring new clients in a variety of ways. See Table 6 for most commonly reported ways through which personal trainers gain new clients and the associated mean frequency. The three most common ways personal trainers reported obtaining new clients included advertising or marketing (19.08%), when a co-worker leaves the company (20.92%) and provided or assigned by their employer (17.39).

Table 6. How Personal Trainer obtain new clients

Marketing Approach	N	Mean Frequency	SD
Advertise/Marketing	226	19.08	23.133
Co-Worker leaves	226	20.92	22.574
Networking	226	11.77	20.443
Provided by employer	226	17.39	21.420
Consultation/Orientation	226	9.00	15.336
Referrals	226	10.27	20.586
Other	226	11.56	16.126

Participant Characteristics for Specific Aim 2

Specific Aim 2 was to examine associations between education, credentials and knowledge of personal trainers with client retention. See Figure 2. for participant flow through the study for client retention analysis. A total of 226 participants were included in the analysis of personal trainer knowledge. Data analyses for Specific Aim 2 only included individuals who reported retention data on at least 2 clients. Of the 226 total participants 135 provided client retention data on less than two clients and were not included in the analysis (n=91).

Figure 3. Survey Participation Flow for Client Retention Analysis

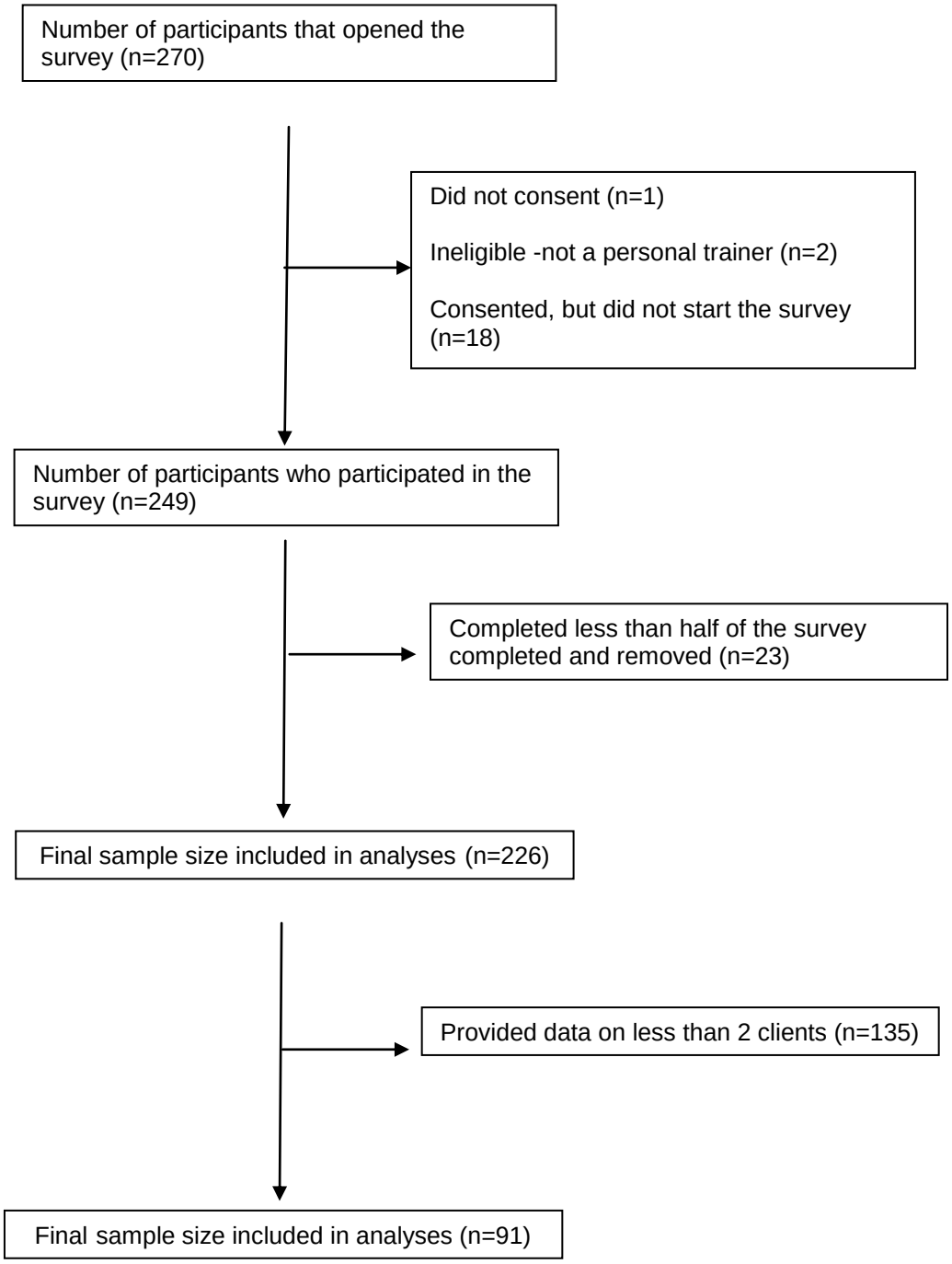

Table 7. provides an overview of the characteristics of the personal trainers (n=91) that made up the data subset used to analyze client retention. rates. Client retention data was not normally distributed using Kolmogorov - Smirnov test in SPSS (p = 0.004). However both skewness (0.962) and kurtosis (0.802) were below 1.0. Because of the level of skewness and kurtosis and parametric statistics were used to analyze client retention data.

The mean age of the participants that provided client retention data was 31.47 [6.37]. That is 0.85 years older than the mean of the full data set which had a mean age of 30.62 [6.0]. Similar to the full sample the majority of the participants were male (64.8%), had a bachelor's degree or higher (59.0%) and had earned a degree in an exercise-science related field (59.3%). Most participants were certified personal trainers (80.2%). The mean of client retention for the sample (n=91) was reported as 77.81[52.90] weeks. Personal trainers reported client retention data on a mean of 5.23 (7.73) clients; 58% of respondents reported data on 2 or 3 clients. Forty-two percent reported client retention data on 3 or more clients, six (6.6%) of which reported data on12 or more clients.

Table 7. Sample Characteristics by personal trainer for client retention analysis (n=91)

Characteristic	Total Sample
Age (mean years)	31.47 [6.37]
Sex (%)	
Male	59 (64.8)
Female	32 (35.2)
Education Level (%)	
Associate's Degree or lower	32 (35.2)
Bachelor's Degree	42 (46.2)
Master's Degree or higher	17 (18.7)
Exercise Science Degree (%)	
Yes	54 (59.3)
No	37 (40.7)
Exercise Science Degree Type (%)	
Associate's Degree	10 (19.2)
Bachelor's Degree	25 (48.1)
Master's Degree or Higher	8 (15.4)
Multiple Degrees	9 (17.3)
Certified Personal Trainer (%)	
Yes	73 (80.2)
No	18 (19.8)

Characteristic	Total Sample
Expired Personal Trainer Certification (%)	
Yes	46 (50.5)
No	45 (49.5)
Group Exercise Certification (%)	
Yes	42 (46.2)
No	49 (53.8)
Years of Experience (%)	
<3 years	20 (22.0)
3-5.99 years	47 (51.6)
6-9.99 years	12 (13.2)
10 or more years	12 (13.2)

Table 8. provides an overview of the characteristic of personal trainers and bivariate associations with client retention. Client retention was significantly associated with personal trainer certification status (yes/no) (t_{38} = 2.277, p = 0.029), education level ($F_{3,87}$ = 8.176, p < 0.001), the type of exercise science degree ($F_{3,48}$ = 6.008, p = 0.001), years of experience ($F_{3,\ 87}$ = 3.169, p = 0.028), and facility size ($F_{4,84}$ = 8.049, p < 0.001). Client retention was not significantly associated with the sex of the personal trainer, having a degree in exercise science (yes/no), the number of personal trainer certifications, the cost of training, facility type, employment status of the personal trainer or knowledge scores (p > 0.05).

The mean total weeks of client retention reported was 77.81[52.90] weeks. Certified personal trainers reported a significantly higher retention (mean = 82.73 [55.17] weeks) than non-certified personal trainers (mean = 57.84 [37.42] weeks). The mean difference between the two groups was 29.91 weeks (t_{38} = 2.277, p = 0.029). Education level was also positively associated with client retention ($F_{3,87}$ = 8.176, p < 0.001). Post hoc analyses using Tukey HSD showed those with a bachelor's degree had significantly higher client retention compared to those with some college (mean difference = 45.48 weeks, p = 0.009). Likewise, those with a bachelor's degree had higher retention compared to an associate degree (mean difference = 44.29 weeks, p = 0.011). Individuals a master's degree or higher had higher retention compared to those with some

college (mean difference = 62.94 weeks, $p = 0.001$) and those with an associate degree (mean difference = 61.85 weeks, $p = 0.002$).

Similarly, the type or level of exercise science degree type was associated with client retention. Personal trainers who reported they had multiple degrees in an exercise science related field (e.g., associates plus bachelors or bachelor's plus master's) reported having significantly higher weeks of client retention ($F_{3,48} = 6.008$, $p = 0.001$). On average, personal trainers with multiple exercise science degrees reported more weeks of client retention compared to personal trainers with only an associate degree (mean difference = 62.37, $p = 0.021$), personal trainers with only an bachelor's degree (mean difference = 73.52 weeks, $p = 0.001$) and personal trainers with a master's degree in exercise science (mean difference = 66.73 weeks, $p = 0.020$).

Facility size was also positively associated with client retention ($F_{4,84} = 8.049$, $p < 0.001$). Tukey HSD showed significant association between client retention and facility size for the following categories; less than 1000 square feet and 5000-15,000 square feet ($p = 0.042$), less than 1000 square feet and 15,000-30,000 square feet ($p = 0.002$), 30,000 square feet or larger and 1000-5000 square feet ($p = 0.002$), 30,000 square feet or larger and 5000-15,000 square feet ($p = 0.001$), and 30,000 square feet or larger and 15,000-30,000 square feet ($p < 0.001$).

Lastly, years of personal training experience was also associated with client retention ($F_{3,87} = 3.169$, $p = 0.028$). The mean difference in client retention for personal trainers with 10 or more years of experience compared to those with less than 3 years of experience and those with 3-6 years of experience was 47.55 weeks ($p = 0.025$) and 50.38 weeks ($p = 0.041$) respectively.

Table 8. Characteristics of Personal Trainers and Client Retention

	Client Retention in weeks [SD]	Test Statistic	Significance
Mean Client Retention for Total Sample (SD)	77.81[52.90]		
Sex		$t_{89} = 0.347$	$p = 0.730$
Male (n=59)	76.27 [47.65]		
Female (n=32)	80.65 [62.16]		
Education Level (n=91)		$F_{3,87} = 8.176$	$p < 0.001$
Some College (n=16)[a]	44.91 [27.18]		
Associate's Degree (n=16)[a]	46.00 [20.14]		
Bachelor's Degree (n=42)[b]	90.29 [54.60]		
Master's Degree or higher (n=17)[b,c]	107.85 [59.74]		
Exercise Science Degree (n=75)		$t_{32} = 0.252$	$p = 0.803$
Yes (n=54)	52.16 [52.16]		
No (n=21)	82.07 [61.38]		
Exercise Science Degree Type (n=52)		$F_{3,48} = 6.008$	$p = 0.001$
Associate's Degree (n=10)[a]	81.87 [36.91]		
Bachelor's Degree (n=25)[a]	71.09 [44.22]		
Master's Degree or Higher (n=8)[a]	77.87 [47.30]		
Multiple Degrees (n=9)[b]	144.61 [54.78]		
Certified Personal Trainer[a]		$t_{38} = 2.277$	$p = 0.029$
Yes	82.73 [55.17]		
No	57.84 [37.42]		
Years of Experience (n=91)		$F_{3,87} = 3.169$	$p = 0.028$
<3 years (n=20)[a]	67.27 [44.26]		
3-5.99 years (n=47)[a]	70.10 [42.39]		
6-9.99 years (n=12)[a,b]	85.71 [56.70]		
10 or more years (n=12)[b]	117.64 [80.81]		
Number of Personal Trainer Certificates (n=91)		$F_{2,88} = 1.471$	$p = 0.235$
0 Certifications (n=19)	60.94 [38.81]		
1 Certification (n=45)	78.93 [59.25]		
2+ Certifications (n=27)	87.79 [48.89]		
Average hourly rate (n=80)		$F_{4,75} = 1.475$	$p = 0.218$
$25 per hour or less (n=17)	90.32 [46.38]		
$26-$50 per hour (n=31)	80.78 [50.56]		
$51-$75 per hour (n=21)	66.43 [50.03]		

	Client Retention in weeks [SD]	Test Statistic	Significance
$76-$100 per hour (n=9)	109.32 [88.20]		
$100+ per hour (n=2)	34.73 [6.10]		
Facility Size (n=89)		$F_{4,84} = 8.049$	$p < 0.001$
Under 1000 square feet[a,c]	120.61 [53.16]		
1000 - 5000 square feet[a,b]	74.80 [51.50]		
5000-15,000 square feet[b]	71.53 [44.87]		
15,000 - 30,000 square feet[b]	47.67 [31.17]		
Over 30,000 square feet[c,d]	161.81 [49.43]		
Type of Facility (n=91)		$F_{6,84} = 1.354$	$p = 0.243$
Regional or National Chain (n=26)	89.66 [58.38]		
Independent Local Health Club (n=32)	79.03[52.04]		
Neighborhood Gym (n=9)	54.94 [25.01]		
Personal Training Studio (n=13)	67.79 [38.40]		
In-home Training (n=6)	97.38 [80.23]		
Outdoors (3)	82.34 [53.05]		
Other (n=2)	6.5 [1.61]		
Employment Status (n=91)		$F_{3,87} = 1.603$	$p = 0.194$
Corporate Employee (n=40)	76.37 [52.00]		
Independent Contractor (n=21)	91.10 [61.46]		
Sole Proprietor (n=23)	61.53 37.76]		
Owner (n=7)	99.58 [66.20]		
Knowledge Score Quartiles (n=91)		$F_{3,87} = 0.388$	$p = 0.762$
0-6 correct (n=45)	80.18 [44.12]		
7-12 correct (n=29)	73.34 [48.36]		
13-18 correct (n=13)	72.43 [82.78]		
19- 24 correct (n=4)	100.84 [71.16]		

[a,b,c,d]Denotes a statistically significant finding. Variables with superscripts with the same letter are not statistically significantly different for one another. Variable with superscripts with different letters are statistically significantly different from one another.

CHAPTER 5

DISCUSSION AND CONCLUSION

Discussion

The purpose of this cross-sectional study was to investigate associations between educational attainment, personal training certification acquisition, and knowledge scores of personal trainers and client retention. There were two Specific Aims for this research. Specific Aim 1 was to examine associations between education and credentials of personal trainers and knowledge of exercise science and personal training principles while Specific Aim 2 was to examine associations between education, credentials and knowledge of personal trainers with client retention.

The median knowledge score in our sample was surprisingly low. The overall median score on the knowledge assessment survey was a meager 6.0 [IQR, 3.00] out of a possible 24. Nearly 92% of the sample scored 41.7% or lower (10 or fewer questions correct out of 24). Our scores were lower than those obtained in previous research studies. Two previous studies have measured knowledge via a survey instrument. Zenko & Ekkekakis (2015) surveyed 1808 ACSM certified individuals using an 11-item quiz on regarding ACSM Exercise guidelines, The mean score for Zenko & Ekkekakis' (2015) 11-item quiz was 4.72 ± 1.87 (42.87 ± 17% correct). Similarly, Malek, et al., (2002) conducted asked 115 participants to complete a survey on a 48-question survey deemed the Fitness Instructor Knowledge Assessment (FIKA$^{(c)}$). Malek, et al., (2002) did not report an overall mean, however findings from this study suggested a mean knowledge score of between (36-85%) depending categorical assignment of the participant by the researcher. Both studies had knowledge scores with higher means than the results from our research. Our scores may be lower than those observed in previous research due to the nature of our sample and the survey we utilized. Our sample was diverse with responses from individuals certified through numerous certifying entities. Likewise, our questions were intended to assess

general knowledge required of a personal trainer and in accordance with the KSAs from four major certifying entities. Our survey questions and sample were not associated with a singular organization and this may explain why our findings resulted in a lower mean score compared to Zenko & Ekkekakis' (2015) and Malek, et al., (2002).

Our preliminary findings suggest that neither educational level nor personal training credentials (certifications) are significantly associated with knowledge scores. However, years of personal training experience was significantly associated with knowledge score in our study. Personal trainers with 10 or more years of experience scored higher on the knowledge portion of the survey compared to personal trainers with less than 10 years of experience $H(3) = 9.280$, $p=0.026$). Zenko and Ekkekakis (2015) reported similar results in their study of exercise professional knowledge. In their study, Zenko and Ekkekakis did not find an association between age, gender, total number of certifications and overall knowledge score. While our findings suggest that work experience is associated with knowledge scores, neither Zenko & Ekkekakis (2015) or Malek, et al., (2002) found an association between work experience and knowledge scores. Findings from Zenko & Ekkekakis' (2015) suggested that educational attainment was associated with knowledge level, with those achieving a higher education scoring better; from 38.72 ± 1.62% for "some college" to 47.01 ± 1.71% for "Doctorate" while our results don't support that finding ($H(4) = 0.447$, $p = 0.978$). A potential reason for different findings between our study and that of Zenko & Ekkekasis is that the participants in our study held personal training certifications from numerous organization and our survey covered broad topics, while their study included only ACSM certified participants and their questions were based solely on ACSM guidelines.

Similar to Zenko & Ekkekakis (2015), Malek, et al., (2002) also found education level was associated with knowledge scores. The authors of the study created a 48-question survey deemed the Fitness Instructor Knowledge Assessment (FIKA$^{(c)}$) to examine relations between

commonly used indicators of knowledge. They found that Individuals with at least a bachelor's degree in exercise science scored higher on all FIKA scales than individuals who did not hold a bachelor's degree in exercise science (68% vs. 37%). They also found that Individuals that were certified by ACSM and/or NSCA scored significantly higher on the FIKA questionnaire than those who weren't certified by either (83% vs. 38%). Malek and associates categorized personal trainers into four groups (1) five or more years of experience or less than five years of experience, (2) bachelor's degree and higher or less than bachelor's degree, (3) the completion of four or more core courses, or less than the four core classes, and (4) either ACSM or NSCA certified or certified by another organization (or not certified at all). Every category of personal trainer in the study by Malek, et al., (2002) had a higher mean score than our finding of 30.04% correct. Malek et al,. (2002) validated the questions on the Fitness Instructor Knowledge Assessment (FIKA$^{(c)}$) survey prior to disseminating the survey to the participants (reliability as indexed by Chronbach's alpha, ranged from 0.57-72 for individual scales and attained 0.90 for the overall scale). Maleks (2002) measure of reliability may, in part, contribute to the reason the participants in his study scored higher than the participants in our study. We did not include a measure of reliability on the knowledge portion of the survey in our research.

In addition to the two studies by Zenko & Ekkekakis (2015) & Malek, et al., (2002), which measured knowledge quantitatively, one study by De Lyon & Cushing (2013), qualitatively examined how personal trainers acquire knowledge. An important finding from this study was that most learning occurred informally and non-formally, beyond dedicated formal training environments. The study concluded that there is a need for an improved integration between the current formal (REPs - United Kingdom) accreditation system and informal knowledge developed that occurs while working as a fitness trainer. De Lyon & Cushing's (2013) study demonstrated that disparities exist between the knowledge accredited fitness trainers acquire during their formal education and the knowledge later used during their professional practice.

De Lyon & Cushing's findings can partially account for the reasons why our survey participants in the present study scored low on the knowledge assessment. If personal trainers are not utilizing the knowledge acquired during preparation for the job, then they may be less likely to retain that information. It cannot completely account for low knowledge scores because personal trainers with more than 10 years of experience scored significantly higher knowledge scores. If knowledge retention diminishes as a result of that knowledge not being utilized frequently on the job, then logic would suggest that those who experienced being formally educated further in the past (personal trainers with 10+ years of experience) should have scored the lowest on the knowledge assessment. Our findings showed the opposite. Perhaps the personal trainers (with 10+ years of experience) that scored the highest learned the formal education material more thoroughly, such that it became long-term memory? Maybe that deeper level of understanding of the information contributed to success in the profession, hence 10 or more years of experience? Or perhaps the additional volume of CEC requirements for personal trainers to maintain certification for more than a decade contributed to reinforcement of the information? Additional studies are necessary to investigate these additional questions.

Because most of our sample was educated, had a bachelor's degree or higher (54.9%) and a personal trainer certification (81.9%) it is relatively safe to assume that the participants in our study had at some point been exposed to the subject matter which we assessed in the knowledge portion of our survey. To obtain a degree or certification participants would have been required to exhibit a greater degree of understanding of the subject matter. A possible explanation for the low scores in our study is that personal trainers have a low level of knowledge retention on subjects that had previously been studied. It's possible knowledge needed to pass a certification exam or test on a college campus is not the same knowledge that is needed to be a successful personal trainer. Further examination into potential disconnects between exam

preparation and daily job tasks of personal trainers is needed to explain the reasons for low knowledge scores from our relatively educated and certified participants.

In regards to client retention, on average personal trainers reported working with their clients for 77.81 [52.90] weeks or 1.50 [1.02] years. There were numerous factors associated with weeks of client retention in bivariate analyses. Our findings suggest that personal training credentials (certification), education level, level of exercise science degree, years of personal training experience and facility size were all positively associated with client retention rates. An interesting finding is that among personal trainers with a degree in an exercise science related subject, only those with multiple degrees had a significant association with client retention compared to those with only an associate, bachelor's, or master's degree. Perhaps the attainment of multiple degrees in exercise science is an indication of commitment to the subject and dedication to the profession of personal training.

To date our research into client retention is the second of its kind. It is not possible to compare our findings to the previous research as (Keenan, R., 2015) determined that the sample size (n=9) was insufficient to determine an accurate measure of client retention and therefore didn't report any statistical data on client retention.

Our study has a similar problem. The sample size in this study was relatively small and homogenous. We also have reservations about the accuracy of our client retention measure given that only 91 out of 226 participants provided data on client retention for two or more individuals. However, our study was meant to be exploratory and our findings suggest the need for additional research in this area. Improving client retention may also lead to more robust outcomes for those using personal training services. Our findings suggest experience, certification and education are important for client retention but these findings need to be confirmed via a longitudinal study.

Strengths and Limitations

This study had several limitations. The major weakness of this study is that it uses a cross-sectional design. Temporal sequence cannot be established in a cross-sectional study which eliminates the possibility to determine cause and effect. Likewise, the cross-sectional design does not allow us to rule out potential confounding variables that could contribute to our findings. Measurement was also problematic in this study. Personal trainers were asked to estimate the how long they have been training each client and there is likely measurement error in our client retention data. Anecdotally, we noted that personal trainers who were more committed to the field in terms of education and experience provided more information about client retention suggesting measurement bias in our findings. Unfortunately, we had no means for measuring the size of the measurement error because there is no gold standard. The interpersonal skill set or personality of each personal trainer had the potential to be a confounding variable that may influence client retention rates. However it was beyond the scale of this Thesis project to assess personal trainers psychologically and assign them into personality categories. We also only collected information from personal trainers and not the personal trainer clientele. Data from the personal trainer's clientele on retention and the reasons they continued or discontinued training would have improved the quality and validity of this research.

We attempted to account for as many confounding variables as possible, however the possibility that additional unknown confounding variables might influence knowledge scores and client retention rates still exist. The potential exists for researcher bias in our selection of knowledge questions from the practice exam questions. Our target sample size to determine significance was n=385, however our final sample size for knowledge score analysis was n=226. For reasons we don't understand numerous participants decided to not include any data or limited data on client retention, therefore our samples size was n=91 for client retention analysis.

Despite numerous limitations there are also strengths in our research design. Our survey was comprehensive. Information was collected on; age, sex, years of experience, certifications (current, expired, non-CPT credentials, group exercise), education level, price of training, location (zip code, for demographics), type of facility, size of facility, job task analysis and the process by which we selected the knowledge questions to minimize researcher bias. We attempted to control for all known confounding variables. An additional strength of this research is its novelty. Our preliminary findings contribute new information to the body of knowledge.

Additional research is needed to replicate our initial findings. Future research should focus on a longitudinal study design that collects client retention data from both the personal trainer and the clientele. That data should be confirmed with transaction records from the employer to validate the client retention data. Improvement should be made on the knowledge assessment methods to ensure validity of the findings. Larger sample sizes will be needed to increase power and allow for generalizability of the findings.

Conclusion

Overall, our findings suggest the knowledge of personal trainers is relatively low (30.04%) as assessed by a knowledge survey containing practice exam questions from organizations who certify personal trainers. Years of personal training experience was the only variable associated with the knowledge score. Most of our participants were both educated and certified, suggesting the personal trainers had been exposed to the information on the knowledge survey at some point. The low knowledge score may therefore be a function of poor knowledge retention. Colleges and universities should reevaluate curriculums to ensure they are providing personal trainers with the information they'll need to succeed in the profession and certifying organizations should ensure that continuing education requirements and curriculum emphasize knowledge retention in addition to knowledge expansion. Finally, the industry should to work together to determine what foundation of knowledge is necessary for personal trainers based on job task

requirements for personal trainers. Collectively, these actions would best prepare personal trainers for the profession. Years of experience was the only variable associated with knowledge scores and this finding suggests informal and non-formal learning may contribute to retention of knowledge. Long-term personal trainers are likely to have greater exposure to on the job training, observational learning, and CEU requirements for employment purposes.

Education, certification, years of training and facility size were also associated with client retention in this exploratory study while knowledge score was not. These findings suggest that clients are more likely to stay with the personal trainer if they have a degree, especially in the field of exercise science and are certified. In recent years, there has been a lot of publicity about what characteristics to look for in a personal trainer and this may account for these associations. Certainly, employers are looking for these characteristics in personal trainers (Schroeder, 2015). Collectively our findings suggest that education, certification and experience will enhance client retention for personal trainers and for the facilities that hire personal trainers.

Employers that are interested in improving client retention rates should hire personal trainers that are certified, educated and have multiple exercise science degrees and have more than 10 years of experience.

Continuing to seek for information and knowledge that will better prepare personal trainers for the profession, may in turn lead to improved outcomes for personal trainer's clientele. Improved preparation and enhanced knowledge for personal trainers may lead to better career opportunities and market expansion. Hopefully more knowledgeable, better prepared, personal trainers delivering better results to more people will improve public health outcomes. The intent of this project was to contribute to the body of knowledge that will lead to that end.

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APPENDIX A

THESIS SURVEY QUESTIONS

An Investigation of the Relationship Between the Education Level, Credentials, and Knowledge of Personal Trainers and Client Retention

Informed Consent

My name is John Preston, I am a graduate student under the direction of Associate Professor, Cheryl Der Ananian, in the Exercise Science and Health Promotion Program, College of Health Solutions at Arizona State University. I am conducting a research study to examine the how education level and personal training certifications are associated with personal trainer knowledge and client retention.

I am inviting your participation in this study because you are a personal trainer. You will be asked to complete an online survey and it is anticipated it will take 15- 30 minutes to complete this survey. Once the survey is completed and submitted your obligation to the research will be complete. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Participants may be eligible to receive a $10 e-gift card from Amazon.com for completing the survey; the first 200 people to complete the survey will be eligible to receive an e-gift card. At the end of the survey participants will have the option to provide an email address. The e-gift card will be emailed to the address provided. The email address provided will be stored in a data base separate from the responses of the survey. There will be no way to associate survey responses to the email addresses provided. You must be 18 or older and a personal trainer providing one-on-one personal training services to participate in the study.

There is no direct benefit to you for your participation in this study. There are no foreseeable risks or discomforts to your participation.

All responses will be confidential. We will not collect any personally identifying information as part of the survey. The IP address collection option has been turned off in the survey software as an extra layer of protection. Survey results will be stored in a secure electronic file on a secured computer in the Arizona Biomedical Center at Arizona State University. Only the researchers directly involved in this study will have access to the files. The results of this study may be used in reports, presentations, or publications but individual names will not be used. In any sort of report we make public, all reports will be shared in the aggregate form. Additionally any email address information collected for the distribution of e-gift cards will be stored in a separate data base.

If you have any questions concerning the research study, please contact the research team at: John Preston 602-999-4593 or john.h.preston@asu.edu, or Cheryl Der Ananian at 602-827-2290 or Cheryld@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study

By selecting "yes" below you are agreeing to be part of the study.

Q1 To be eligible to complete this survey you must be currently providing one-on-one personal training services. Only completed surveys will be included in the final research analysis. Please

make sure to complete the survey in its entirety. Thank you. Are you currently working as a personal trainer providing one-on-one personal training?

Yes (1)
No (2)

Condition: Yes Is Selected. Skip To: What is your age?.Condition: No Is Selected. Skip To: End of Survey.

Q3 What is your age?

Condition: What is your age? Is Less Than 18. Skip To: End of Survey.

Q2 What is your sex?

Male (1)
Female (2)

Q4 What is your highest level of education?

Less than high school education or diploma (1)
High school graduate/GED (2)
Some college (3)
Associate degree (4)
Bachelor's degree (5)
Master's degree (6)
Doctoral degree (Ph.D, DPT, Ed.D., etc.) (7)

Condition: Less than high school educa... Is Selected. Skip To: Are you currently certified as a pers....Condition: High school graduate/GED Is Selected. Skip To: Are you currently certified as a pers....Condition: Some college Is Selected. Skip To: Are you currently certified as a pers....Condition: Associate degree Is Selected. Skip To: Is (or are any of) your college degre....Condition: Bachelor's degree Is Selected. Skip To: Is (or are any of) your college degre....Condition: Master's degree Is Selected. Skip To: Is (or are any of) your college degre....Condition: Doctoral degree (Ph.D, DPT,... Is Selected. Skip To: Is (or are any of) your college degre....

Q66 Is (or are any of) your college degree(s) in an Exercise Science related major?

Yes (1)
No (2)

Condition: No Is Selected. Skip To: Are you currently certified as a pers....

Q5 Select all of your degrees that are in an Exercise Science related major (please do not select degree levels in which you have a degree in a non-Exercise Science major).

N/A (1)
Associates Degree (2)
Bachelor's Degree (3)
Master's Degree (4)
Doctoral Degree (5)

Q9 Are you currently certified as a personal trainer? (Please do not include group exercise, yoga, Pilates, etc. when answering this question)

Yes (1)
No (2)

Condition: No Is Selected. Skip To: If no, have you previously held a per....Condition: Yes Is Selected. Skip To: If yes, please identify the professio....

Q10 Please identify the professional organization(s) through which are you currently hold the certified personal trainer credential (please consider only the certified personal trainer CPT level credential for this question and select all that apply).

N/A (1)
Academy of Applied Personal Training Education (AAPTE) (2)
American Council on Exercise (ACE) (3)
American College of Sports Medicine (ACSM) (4)
ACTION Certification (ACTION) (5)
The Cooper Institute (CI) (6)
International Fitness Professionals Association (IFPA) (7)
National Academy of Sports Medicine (NASM) (8)
National Council on Strength and Fitness (NCSF) (9)
National Exercise and Sports Trainers Association (NESTA) (10)
National Exercise Trainers Association (NETA) (11)
National Federation of Professional Trainers (NFPT) (12)
National Strength and Conditioning Association (NSCA) (13)
PTA Global, Inc. (PTA Global, Inc.) (14)
Other, please specify? (15) _____

Q12 Have you previously held a personal training certification that has since expired?

Yes (1)
No (2)

Condition: No Is Selected. Skip To: Do you have a certification other tha....

Q13 Please identify the professional organization(s) through which you have been certified as a personal trainer (CPT) in the past. (select all that apply).

N/A (1)
Academy of Applied Personal Training Education (AAPTE) (2)
American Council on Exercise (ACE) (3)
American College of Sports Medicine (ACSM) (4)
ACTION Certification (ACTION) (5)
The Cooper Institute (CI) (6)
International Fitness Professionals Association (IFPA) (7)
National Academy of Sports Medicine (NASM) (8)
National Council on Strength and Fitness (NCSF) (9)
National Exercise and Sports Trainers Association (NESTA) (10)
National Exercise Trainers Association (NETA) (11)
National Federation of Professional Trainers (NFPT) (12)
National Strength and Conditioning Association (NSCA) (13)
PTA Global, Inc. (PTA Global, Inc.) (14)
Other, Please Specify (15) _____

Q68 Do you have a certification other than CPT (e.g. NCSA CSCS or NASM PES)?

Yes (1)
No (2)

Condition: No Is Selected. Skip To: Are you currently certified as a grou....

Q67 Please select all organizations for which you hold a certification other than that of certified personal trainer (CPT) (e.g. ACSM EP-C or NASM CES). After selecting each organization please list the specific credential in the field next to your selection(s).

N/A (1)
Academy of Applied Personal Training Education (AAPTE) (2) _____
American Council on Exercise (ACE) (3) _____
American College of Sports Medicine (ACSM) (4) _____
ACTION Certification (ACTION) (5) _____
The Cooper Institute (CI) (6) _____
International Fitness Professionals Association (IFPA) (7) _____
National Academy of Sports Medicine (NASM) (8) _____
National Council on Strength and Fitness (NCSF) (9) _____
National Exercise and Sports Trainers Association (NESTA) (10) _____
National Exercise Trainers Association (NETA) (11) _____
National Federation of Professional Trainers (NFPT) (12) _____
National Strength and Conditioning Association (NSCA) (13) _____
PTA Global, Inc. (PTA Global, Inc.) (14) _____
Other, Please Specify (15) _____

Q15 Are you currently certified as a group exercise instructor?

Yes (1)
No (2)

Condition: No Is Selected. Skip To: Do you currently hold any other indus....

Q16 If yes, how many group exercise certifications do you currently hold?

Q17 Do you currently hold any other industry credentials. (e.g. FMS, TPI, etc)? Please do not repeat any credentials or certifications that you provided in previous responses.

Yes (1)
No (2)

Condition: No Is Selected. Skip To: How long have you worked as a persona....

Q18 If yes, how many additional industry credentials do you currently hold?

Q19 How long have you worked as a personal trainer?

Years (1)
Months (2)

Q20 In what ZIP code do you provide the majority of your personal training services?

Q21 Which of the following best describes your current personal training position?

Employed by a business or corporation (1)
Independent Contractor (2)
Sole Proprietor (Own your own business, but have no employees or independent contractors) (3)
Owner (Own your own business, but employ and manage employees and/or independent contractors) (4)
Other (5) _____

Q22 On average, how many hours per week do you typically work as a personal trainer?

Q23 Which of the following best describes the facility where you train your clients?
A regional or national health and fitness club chain (1)
An independent local health and fitness club (stand alone) (2)
A neighborhood gym (3)
A personal training studio (4)
In-home personal training (5)
An outdoor setting (6)
Other (7) _____

Q24 What is the size of the facility in which you train your clients?
Under 1000 square feet (1)
1000 - 5000 square feet (2)
5000-15,000 square feet (3)
15,000 - 30,000 square feet (4)
over 30,000 square feet (5)

Q25 On average what do you or your facility charge for a one hour personal training session?

Q65 In the past 30 days how many one-on-one personal training clients have utilized your personal training services? (Please do not include small group training clients)

Q28 Enter client #${lm://CurrentLoopNumber} initials
Q29 One average, how many times per week do you train client #${lm://CurrentLoopNumber}

Q30 What is the duration of each session with client #${lm://CurrentLoopNumber}
30 minutes (1)
60 minutes (2)
90 minutes (3)
Other (4) _____

Q31 How long have you been training client #${lm://CurrentLoopNumber}
Years (1)
Months (2)
Weeks (3)

Q32 How do you get new clients? (Total must equal 100%?)
_____ Advertisement/Promotional material (1)
_____ A coworker/personal trainer quits (2)
_____ From employer/ membership department (3)
_____ Networking events (4)
_____ New member orientations (5)
_____ Referrals from current or former clients (6)
_____ Other (7)

Q33 How many new one-on-one personal training clients have you acquired in the last 30 days?

Q34 How many one-on-one personal training clients decided to stop training with you in the last 30 days?

Q35 List the top 3 reasons why you think that clients continue to train with you?
Reason #1 (1)
Reason #2 (2)
Reason #3 (3)

Q36 List the top 3 reasons why you think that clients stop training with you?
Reason #1 (1)
Reason #2 (2)
Reason #3 (3)

Q37 Redacted at the request of the copyright holder.

Q38 Which of the following is an agreement or promise between two or more parties that creates a legal obligation to do or not to do something?
Tort (1)
Contract (2)
Promissory note (3)
Memorandum of understanding (4)

Q39 Redacted at the request of the copyright holder

Q40 Which of the following is a short-term behavioral goal?
Increase lean body mass by 2 pounds (1 kg) per month (1)
Decrease abdominal girth by 4 inches (10 cm) (2)
Increase number of weight training sessions to 3 per week (3)
Lose 1.5 pounds (0.68 kg) per week for six weeks (4)

Q41 Redacted at the request of the copyright holder.

Q42 After the first four weeks of a resistance training program, a previously sedentary client experiences a 15 lb (7 kg) increase in her 1RM bench press and a 25 lb (11 kg) increase in her 1RM leg press. Which of the following is primarily responsible?
Muscle fiber size (1)
Creatine phosphate stores (2)
Neural activation (3)
Muscle fiber splitting (4)

Q43 Redacted at the request of the copyright holder.

Q44 Which of the following most determines the predominant energy system used during exercise?
Duration (1)
Intensity (2)
Frequency (3)
Mode (4)

Q45 Redacted at the request of the copyright holder.

Q46 Redacted at the request of the copyright holder.

Q47 Redacted at the request of the copyright holder.

Q48 Redacted at the request of the copyright holder

Q49 Which of the following statements indicates that your client has successfully implemented a SMART goal?

I want to lose weight and trim down (1)
I want to build muscle and bulk up (2)
I want the ability to climb the stairs without getting winded (3)
I want to run a 10k in 90 days (4)

Q50 The energy system most associated with an increase in ATP demand at the start of exercise is the ___ pathway.

fast glycolysis (1)
phosphagen (2)
oxidative phosphorylation (3)
slow glycolysis (4)

Q51 Redacted at the request of the copyright holder.

Q52 Redacted at the request of the copyright holder

Q53 A female client is preparing for her first 10-km race. The client has controlled type I diabetes and she has been cleared to exercise by her physician. Which of the following is the most effective method for preventing hypoglycemia during the race?

Increasing insulin dosage (1)
Consume a high protein snack (2)
Increasing carbohydrate intake (3)
Decrease carbohydrate intake (4)

Q54 Redacted at the request of the copyright holder.

Q55 Redacted at the request of the copyright holder.

Q56 Based on the 2008 Physical Activity Guidelines for Americans, which of the following is the recommended weekly cumulative amount of time for moderate intensity aerobic activity?

75 minutes (1)
90 minutes (2)
120 minutes (3)
150 minutes (4)

Q57 Which of the following contributes to rapid weight loss when consuming a low carbohydrate diet?

Increase in waste excretion (1)
Loss of body fat (2)
Increase in digestive enzyme activity (3)
Loss of water (4)

Q58 Which of the following is the most appropriate programming for a whole-body workout?
Upper body Wednesday & Friday, lower body Saturday & Sunday (1)
Upper body Tuesday & Wednesday, lower body Friday and Sunday (2)
Upper body Saturday & Wednesday, lower body Sunday & Thursday (3)
Upper Body on Thursday, Lower Body on Saturday (4)

Q59 Redacted at the request of the copyright holder.

Q60 An 82-year-old female client feels nervous when walking down stairs. She would like to improve her balance. What exercise would be the most appropriate to begin with?
Toe stands (1)
Upright rows (2)
Single-leg stands (3)
Wall ball squats (4)

Q62 Instruction: How well do the following statements describe your personality? I see myself as someone who...

	Strongly disagree (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree strongly (5)
...is reserved (1)					
...is generally trusting (2)					
...tends to be lazy (3)					
...is relaxed, handles stress well (4)					
...has few artistic interests (5)					
...is outgoing, sociable (6)					
...tends to find fault with others (7)					
...does a thorough job (8)					
...gets nervous easily (9)					
...has an active imagination (10)					

Scoring the BFI-10 scales:
Extraversion: 1R, 6; Agreeableness: 2, 7R; Conscientiousness: 3R, 8; Neuroticism: 4R, 9; Openness: 5R; 10 (R item is reversed-scored)

Q69 This portion of the survey is designed to gather feedback from personal trainers about the daily roles, responsibilities and job tasks of the personal training profession. You will be asked to review 18 daily job task statements that are organized into six major Knowledge, Skills and Abilities (KSA's) topic areas. The six major KSA topic areas are listed below:
Major KSA Topic #1 - Interviews, Consultations, Assessments and Risk Appraisal Major KSA Topic #2 - Anatomy, Physiology, Basic and Applied Sciences Major KSA Topic #3 - Program Design and Planning, Special Populations Major KSA Topic #4 - Nutrition Major KSA Topic #5 - Communication, Goal Setting, Behavior Modification Major KSA Topic #6 - Scope of Practice, Professional Conduct, Emergency Procedures
For each of the 18 task statements, please answer the following question: What degree of potential harm to clientele (physical, emotional, financial, etc.) might result if a personal trainer could not perform the task competently?

	No Harm (1)	Minimal Harm (2)	Moderate Harm (3)	Substantial harm (4)	Extreme Harm (5)
Obtain health, medical, exercise, and lifestyle information using questionnaires, interviews, and appropriate documentation. (1)					
Determine risk for exercise participation, identify the need for medical clearance and referrals. (2)					
Assess the quality of movement patterns through observation and develop appropriate exercise plan. (3)					
Select and conduct baseline fitness assessments to facilitate safe and effective programs and monitor changes over time. (4)					
Select appropriate exercises and equipment to design client programs. (5)					
Instruct clients on safe and effective equipment use and exercise techniques using verbal, visual, and kinesthetic					

cues. (6) Design personalized exercise programs by applying appropriate exercise science principles and guidelines. (7) Routinely evaluate progress by using data, observations, and client feedback and modify programs as needed. (8) Review diet journal and estimate client's energy expenditure and requirement, advise client on guidelines for weight gain and weight loss. (9) Discuss nutritional supplementation and advise clients on the role and appropriateness of dietary supplementation. (10) Discuss the practical issues of dietary challenges associated with social situations, dining out, travel and competition planning and provide appropriate advice to clients. (11) Assess client readiness for behavior change and evaluate exercise attitudes and beliefs to build rapport and establish appropriate goals. (12) Develop appropriate functional, health, fitness, or performance goals by interpreting client interview and assessment information. (13)					

Recognize lapses in program adherence, identify barriers and provide solutions to address improve client participation. (14)					
Promote program adherence through motivation, education, and modification to achieve client goals. (15)					
Document and secure client data to maintain confidentiality and minimize liability, in accordance with legal and regulatory requirements. (16)					
Enhance competency by using credible resources to stay current with evidence-based research, theories, and practices. (17)					
Prevent injury by identifying and reporting potential hazards in accordance with recommended industry or facility protocols. (18)					

Q70 For each of the 18 task statements, please answer the following question: How important is it for a personal trainer to perform the task competently (to be effective and successful)?

	Not Important (1)	Minimally Important (2)	Moderately Important (3)	Very Important (4)	Extremely Important (5)
Obtain health, medical, exercise, and lifestyle information using questionnaires, interviews, and appropriate documentation. (1)					

Determine risk for exercise participation, identify the need for medical clearance and referrals. (2) Assess the quality of movement patterns through observation and develop appropriate exercise plan. (3) Select and conduct baseline fitness assessments to facilitate safe and effective programs and monitor changes over time. (4) Select appropriate exercises and equipment to design client programs. (5) Instruct clients on safe and effective equipment use and exercise techniques using verbal, visual, and kinesthetic cues. (6) Design personalized exercise programs by applying appropriate exercise science principles and guidelines. (7) Routinely evaluate progress by using data, observations, and client feedback and modify programs as needed. (8) Review diet journal and estimate client's					

energy expenditure and requirement, advise client on guidelines for weight gain and weight loss. (9) Discuss nutritional supplementation and advise clients on the role and appropriateness of dietary supplementation. (10) Discuss the practical issues of dietary challenges associated with social situations, dining out, travel and competition planning and provide appropriate advice to clients. (11) Assess client readiness for behavior change and evaluate exercise attitudes and beliefs to build rapport and establish appropriate goals. (12) Develop appropriate functional, health, fitness, or performance goals by interpreting client interview and assessment information. (13) Recognize lapses in program adherence, identify barriers and provide solutions to					

address improve client participation. (14)					
Promote program adherence through motivation, education, and modification to achieve client goals. (15)					
Document and secure client data to maintain confidentiality and minimize liability, in accordance with legal and regulatory requirements. (16)					
Enhance competency by using credible resources to stay current with evidence-based research, theories, and practices. (17)					
Prevent injury by identifying and reporting potential hazards in accordance with recommended industry or facility protocols. (18)					

Q71 For each of the 18 task statements, please answer the following question: How frequently would a personal trainer be expected to perform the task?

	Never (1)	< Monthly - once/year (2)	Once a month (3)	Once a week (4)	Daily (5)
Obtain health, medical, exercise, and lifestyle information using questionnaires,					

interviews, and appropriate documentation. (1) Determine risk for exercise participation, identify the need for medical clearance and referrals. (2) Assess the quality of movement patterns through observation and develop appropriate exercise plan. (3) Select and conduct baseline fitness assessments to facilitate safe and effective programs and monitor changes over time. (4) Select appropriate exercises and equipment to design client programs. (5) Instruct clients on safe and effective equipment use and exercise techniques using verbal, visual, and kinesthetic cues. (6) Design personalized exercise programs by applying appropriate exercise science principles and guidelines. (7) Routinely evaluate progress by using data, observations, and client feedback and modify programs as					

needed. (8) Review diet journal and estimate client's energy expenditure and requirement, advise client on guidelines for weight gain and weight loss. (9) Discuss nutritional supplementation and advise clients on the role and appropriateness of dietary supplementation. (10) Discuss the practical issues of dietary challenges associated with social situations, dining out, travel and competition planning and provide appropriate advice to clients. (11) Assess client readiness for behavior change and evaluate exercise attitudes and beliefs to build rapport and establish appropriate goals. (12) Develop appropriate functional, health, fitness, or performance goals by interpreting client interview and assessment information. (13) Recognize lapses in					

program adherence, identify barriers and provide solutions to address improve client participation. (14) Promote program adherence through motivation, education, and modification to achieve client goals. (15) Document and secure client data to maintain confidentiality and minimize liability, in accordance with legal and regulatory requirements. (16) Enhance competency by using credible resources to stay current with evidence-based research, theories, and practices. (17) Prevent injury by identifying and reporting potential hazards in accordance with recommended industry or facility protocols. (18)					

APPENDIX B

KNOWLDEGE SECTION OF THE SURVEY WITH CORRESPONDING KNOWLEDGE, SKILLS AND ABILITIES (KSA'S)

Questions 1-4 addressed Major KSA Topic #1 - Interviews, Consultations, Assessments and Risk Appraisal. Specifically they address the "KSA's" from each of the following organizations;

ACE Domain I - Client Interviews and Assessments
ACSM Category 2 - Health Appraisal, Fitness, and Clinical Exercise Testing
ACSM Category 8 - Clinical and Medical Considerations
NASM Domain 2 - Assessment
NSCA Topic Area 1 - Client Consultation and Assessment

The correct response for all questions is in bold type. Please see Appendix A for the actual order that the following questions appeared in the survey.

1 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of open-ended questions.

2 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of agreements, releases and consent forms.

3 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of cardiorespiratory assessments with a client taking a beta blocker.

4 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of postural screening

Questions 5-8 addressed Major KSA Topic #2 - Anatomy, Physiology, Basic and Applied Sciences Specifically they address the "KSA's" from each of the following organizations;

ACE Domain II - Program Design and Implementation
#5 Knowledge of general anatomy, physiology (e.g., neuromuscular, musculoskeletal, cardiorespiratory), kinesiology, and biomechanics
ACSM Category 1 - Exercise Physiology and Related Exercise Sciences
NASM Domain 1 - Basic and Applied Sciences
NSCA Topic Area 2 - Program Planning

- C. Training Adaptations
  - 1. Describe exercise-induced changes to body structures
    - a. muscles
    - b. tendons, ligaments, and connective tissue
    - c. bone and cartilage
    - d. adipose tissue (fat stores)
  - 2. Describe exercise-induced changes to body systems
    - a. neuromuscular
    - b. cardiorespiratory
    - c. metabolic
    - d. endocrine
    - e. psychological

5 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of physiological responses to high ambient temperature.

6 - The energy system most associated with an increase in ATP demand at the start of exercise is the ___ pathway. (Thesis committee, based on similar question from NASM)

fast glycolysis
phosphagen
oxidative phosphorylation
slow glycolysis

7 - Which of the following most determines the predominant energy system used during exercise? (NSCA CPT practice exam question)

Duration
Intensity
Frequency
Mode

8 - After the first four weeks of a resistance training program, a previously sedentary client experiences a 15 lb (7 kg) increase in her 1RM bench press and a 25 lb (11 kg) increase in her 1RM leg press. Which of the following is primarily responsible? (NSCA CPT practice exam question)

Muscle fiber size
Creatine phosphate stores
Neural activation
Muscle fiber splitting

Questions 9-13 addressed Major KSA Topic #3 - Program Design and Planning, Special Populations. Specifically they address the "KSA" from each of the following organizations;

ACE Domain II - Program Design and Implementation
Domain III - Program Progression and Modifications
ACSM Category 3 - Exercise Prescription and Programming
NASM Domain 4 - Program Design
Domain 3 - Exercise Technique and Training Instruction
NSCA Topic Area 2 - Program Planning
B. Program Design
1. Select the exercise modality or type
2. Select the warm-up/cool down exercises
3. Determine the order of exercises or exercise components
4. Determine the exercise intensity or workload
5. Determine exercise duration
6. Determine exercise frequency
7. Determine the rate of exercise progression
Topic Area 4 - Techniques of Exercise

9 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of exercise selection for core and hip stability and hip mobility.

10 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of exercise prescription components.

11 - Based on the 2008 Physical Activity Guidelines for Americans, which of the following is the recommended weekly cumulative amount of time for moderate intensity aerobic activity? (Thesis committee, based on similar question from NASM)

75 minutes
90 minutes
120 minutes
150 minutes

12 - An 82-year-old female client feels nervous when walking down stairs. She would like to improve her balance. What exercise would be the most appropriate to begin with? (Thesis committee, based on similar question from NASM)

Toe stands
Upright rows
Single-leg stands
Wall ball squats

13 - Which of the following is the most appropriate programming for a whole-body workout? (NSCA CPT practice exam question)

Upper body Wednesday & Friday, lower body Saturday & Sunday
Upper body Tuesday & Wednesday, lower body Friday and Sunday
Upper body Saturday & Wednesday, lower body Sunday & Thursday
Upper Body on Thursday, Lower Body on Saturday

Questions 14-16 addressed Major KSA Topic #4 - Nutrition. Specifically they address the "KSA's" from each of the following organizations;

ACE Domain II - Program Design and Implementation
Task 1, Knowledge of:
1. Appropriate dietary assessment protocols, purposes, inherent risks, and benefits (e.g., 24-hour diet recall, food logs, food frequency questionnaire)
ACSM Category 4 - Nutrition and Weight Management
NASM Domain 5 - Considerations in Nutrition
NSCA - Topic Area 1
D. Basic Nutrition Review
1. Identify the personal trainer's scope of practice regarding nutritional recommendations
2. Conduct a review of a client's dietary habits (e.g., recall, history, or food records)
3. Communicate basic information from peer-reviewed resources regarding nutrition, supplements, nutrient timing, and daily caloric needs
4. Recognize the signs and symptoms of an eating disorder
5. Refer client to and/or seek input from an appropriate healthcare professional

14 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of water soluble vitamins.

15 - Which of the following contributes to rapid weight loss when consuming a low carbohydrate diet? (Thesis committee, based on similar question from NASM)

Increase in waste excretion
Loss of body fat
Increase in digestive enzyme activity
Loss of water

16 - A female client is preparing for her first 10-km race. The client has controlled type I diabetes and she has been cleared to exercise by her physician. Which of the following is the most effective method for preventing hypoglycemia during the race? (NSCA CPT practice exam question)

Increasing insulin dosage
Consume a high protein snack
Increasing carbohydrate intake
Decrease carbohydrate intake

Questions 17-20 addressed Major KSA Topic #5 - Communication, Goal Setting, Behavior Modification. Specifically they address the "KSA" from each of the following organizations;

ACE Domain I
Task 2 Knowledge of:

1. Appropriate questions and questionnaires to determine client attitudes, preferences, and readiness for behavior change
2. Common types of exercise barriers, motivators, and client expectations
3. Communication styles and strategies (e.g., nonverbal, verbal cues)
4. Goal setting, process and outcome goals, SMART (Specific, measureable, attainable, relevant, time-bound) goals

ACSM Category 5 - Human Behavior and Counseling
NASM Domain 6 - Client Relations and Behavioral Coaching
NSCA Topic Area 2
A. Goal Setting

1. Establish needs and goals by discussing the results of a fitness evaluation with a client
2. Establish needs and goals by discussing the results of dietary habit log with a client
3. Establish needs and goals by discussing health-related lifestyle habits (e.g., smoking, alcohol use) with a client
4. Determine the motivational/coaching techniques (e.g., reward system, reinforcement strategies, mental imagery techniques, visualization) that will be effective for a client

17 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic stages of the client-trainer relationship.

18 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of stages of motivational readiness.

19 - Which of the following statements indicates that your client has successfully implemented a SMART goal? (Thesis committee, based on similar question from NASM)

I want to lose weight and trim down.
I want to build muscle and bulk up.

I want the ability to climb the stairs without getting winded.
I want to run a 10k in 90 days.

20 - Which of the following is a short-term behavioral goal? (NSCA CPT practice exam question)
Increase lean body mass by 2 pounds (1 kg) per month
Decrease abdominal girth by 4 inches (10 cm)
Increase number of weight training sessions to 3 per week
Lose 1.5 pounds (0.68 kg) per week for six weeks

Questions 21-24 addressed Major KSA Topic Area #6 - Scope of Practice, Professional Conduct, Emergency Procedures. Specifically they address the "KSA" from each of the following organizations;

ACE Domain IV - Professional Conduct, Safety, and Risk Management
ACSM Category 6 - Safety, Injury Prevention, and Emergency Procedures
Category 7 - Program Administration, Quality Assurance, and Outcome Assessment
NASM Domain 7 - Professional Development & Responsibility.
NSCA Topic Area 4 - Techniques of Exercise and Safety, Emergency Procedures and Legal Issues

21 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of personal trainer's scope of practice.

22 - Redacted at the request of the copyright holder. ACSM CPT practice exam question on the topic of negligence.

23 - Redacted at the request of the copyright holder. ACE CPT practice exam question on the topic of personal trainer's scope of practice.

24 - Which of the following is an agreement or promise between two or more parties that creates a legal obligation to do or not to do something?(NSCA CPT practice exam question)
Tort
Contract
Promissory note
Memorandum of understanding

APPENDIX C

SIX MAJOR KSA TOPIC AREAS AND CORRESPONING KSA'S FROM ACE, ACSM, NASM AND NSCA

Major KSA Topic #1 - Interviews, Consultations, Assessments and Risk Appraisal

ACE Domain I - Client Interviews and Assessments
ACSM Category 2 - Health Appraisal, Fitness, and Clinical Exercise Testing
ACSM Category 8 - Clinical and Medical Considerations
NASM Domain 2 - Assessment
NSCA Topic Area 1 - Client Consultation and Assessment

Major KSA Topic #2 - Anatomy, Physiology, Basic and Applied Sciences

ACE Domain II - Program Design and Implementation
- #5 Knowledge of general anatomy, physiology (e.g., neuromuscular, musculoskeletal, cardiorespiratory), kinesiology, and biomechanics

ACSM Category 1 - Exercise Physiology and Related Exercise Sciences
NASM Domain 1 - Basic and Applied Sciences
NSCA Topic Area 2 - Program Planning
- C. Training Adaptations
  1. Describe exercise-induced changes to body structures
     a. muscles
     b. tendons, ligaments, and connective tissue
     c. bone and cartilage
     d. adipose tissue (fat stores)
  2. Describe exercise-induced changes to body systems
     a. neuromuscular
     b. cardiorespiratory
     c. metabolic
     d. endocrine
     e. psychological

Major KSA Topic #3 - Program Design and Planning

ACE Domain II - Program Design and Implementation
Domain III - Program Progression and Modifications
ACSM Category 3 - Exercise Prescription and Programming
NASM Domain 4 - Program Design
Domain 3 - Exercise Technique and Training Instruction
NSCA Topic Area 2 - Program Planning
- B. Program Design
  1. Select the exercise modality or type
  2. Select the warm-up/cool down exercises
  3. Determine the order of exercises or exercise components
  4. Determine the exercise intensity or workload
  5. Determine exercise duration
  6. Determine exercise frequency
  7. Determine the rate of exercise progression
- Topic Area 4 - Techniques of Exercise

Major KSA Topic #4 - Nutrition

ACE Domain II - Program Design and Implementation

Task 1, Knowledge of:

1. Appropriate dietary assessment protocols, purposes, inherent risks, and benefits (e.g., 24-hour diet recall, food logs, food frequency questionnaire)

ACSM Category 4 - Nutrition and Weight Management

NASM Domain 5 - Considerations in Nutrition

NSCA - Topic Area 1

D. Basic Nutrition Review

1. Identify the personal trainer's scope of practice regarding nutritional recommendations
2. Conduct a review of a client's dietary habits (e.g., recall, history, or food records)
3. Communicate basic information from peer-reviewed resources regarding nutrition, supplements, nutrient timing, and daily caloric needs
4. Recognize the signs and symptoms of an eating disorder
5. Refer client to and/or seek input from an appropriate healthcare professional

Major KSA Topic #5 - Communication, Goal Setting, Behavior Modification

ACE Domain I

Task 2 Knowledge of:

1. Appropriate questions and questionnaires to determine client attitudes, preferences, and readiness for behavior change
2. Common types of exercise barriers, motivators, and client expectations
3. Communication styles and strategies (e.g., nonverbal, verbal cues)
4. Goal setting, process and outcome goals, SMART (Specific, measureable, attainable, relevant, time-bound) goals

ACSM Category 5 - Human Behavior and Counseling

NASM Domain 6 - Client Relations and Behavioral Coaching

NSCA Topic Area 2

A. Goal Setting

1. Establish needs and goals by discussing the results of a fitness evaluation with a client
2. Establish needs and goals by discussing the results of dietary habit log with a client
3. Establish needs and goals by discussing health-related lifestyle habits (e.g., smoking, alcohol use) with a client
4. Determine the motivational/coaching techniques (e.g., reward system, reinforcement strategies, mental imagery techniques, visualization) that will be effective for a client

Major KSA Topic Area #6 - Scope of Practice, Professional Conduct, Emergency Procedures

ACE Domain IV - Professional Conduct, Safety, and Risk Management

ACSM Category 6 - Safety, Injury Prevention, and Emergency Procedures
Category 7 - Program Administration, Quality Assurance, and Outcome Assessment
NASM Domain 7 - Professional Development & Responsibility.
NSCA Topic Area 4 - Techniques of Exercise and Safety, Emergency Procedures and Legal Issues

APPENDIX D

APPROVAL TO USE CERTIFICATION PRACTICE EXAM QUESTIONS

Keith Cinea keith.cinea@nsca.com via 7196326722.onmicrosoft.comm

May 9, 2017

to john.h.preston

John,
Thank you for following up.

The NSCA grants you permission to use practice (up to 12) of the NSCA-CPT practice questions for your thesis.

Keith Cinea
Publications and Education Director
National Strength and Conditioning Association

AMERICAN COUNCIL ON EXERCISE

July 7, 2017

Cheryl Der Ananian, PhD
Associate Professor
ASU School of Nutrition & Health Promotion
500 North 3rd Street
Phoenix, AZ 85004
Email: Cheryl.DerAnanian@asu.edu

Re: Copyright Permission for ACE Sample Exam Questions

Dear Dr. Der Ananian:

Thank you for your correspondence requesting permission to use 12 of 14 questions from the ACE Personal Trainer practice exam (the "ACE Content") for a survey to assess personal trainer knowledge.

We appreciate your contacting us prior to your use. We will agree to grant you gratis permission for the use, subject to the following conditions:

1) The ACE Content shall only be used for the survey as specified in this letter.

2) The ACE Content shall be used as part of an online survey to personal trainers as part of research being conducted by John Preston, MS student at ASU. It is anticipated that 400 personal trainers will be asked to complete the survey.

3) This permission is for the limited use set forth herein, and all other rights are reserved by and to the American Council on Exercise.

4) You shall send to the attention of the Legal Department at American Council on Exercise one copy of your survey material and the results for our permissions library.

This permission shall be valid contingent upon your signing and returning to us one copy of this license within thirty (30) days. Permission shall continue as long as you comply with and continue to perform all of the terms and conditions hereof on your part to be performed or

until sooner revoked by the American Council on Exercise upon thirty (30) days prior written notice to you.

Please contact me with any additional or future questions you may have regarding American Council on Exercise trademarks or copyrights.

Sincerely,

Steven L. Mashal
Corporate Counsel

AGREED AND ACCEPTED

By: _____

Printed Name: _____

Title: _____

Date: _____

APPENDIX E

IRB APPROVAL

EXEMPTION GRANTED
Cheryl Der Ananian
SNHP: Exercise Science and Health Promotion
602/827-2290
Cheryl.Derananian@asu.edu
Dear Cheryl Der Ananian:
On 6/27/2017 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	An Investigation of the Relationship Between the Education Level Credentials, and Knowledge of Personal Trainers and Client Retention
Investigator:	Cheryl Der Ananian
IRB ID:	STUDY00006364
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Recruitment email, Category: Recruitment Materials; • IRB_application_form_(John_Preston)2.docx, Category: IRB Protocol; • Survey Instrument, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Informed Consent, Category: Consent Form;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 6/27/2017.
In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).
Sincerely,
IRB Administrator
cc: John Preston
Jesse Vezina
Christopher Berger
John Preston

APPENDIX F

LIST OF PERSONAL TRAINER CERTIFICATION OPTION

Below is the list of accredited organizations which were presented as options in the survey for Certified Personal Trainers.

Academy of Applied Personal Training Education (AAPTE)
American Council on Exercise (ACE)
American College of Sports Medicine (ACSM)
ACTION Certification (ACTION)
The Cooper Institute (CI)
International Fitness Professionals Association (IFPA)
National Academy of Sports Medicine (NASM)
National Council on Strength and Fitness (NCSF)
National Exercise and Sports Trainers Association (NESTA)
National Exercise Trainers Association (NETA)
National Federation of Professional Trainers (NFPT)
National Strength and Conditioning Association (NSCA)
PTA Global, Inc. (PTA)

APPENDIX G

INFORMED CONSENT FORM

Informed Consent

My name is John Preston, I am a graduate student under the direction of Associate Professor, Cheryl Der Ananian, in the Exercise Science and Health Promotion Program, College of Health Solutions at Arizona State University. I am conducting a research study to examine the how education level and personal training certifications are associated with personal trainer knowledge and client retention.

I am inviting your participation in this study because you are a personal trainer. You will be asked to complete an online survey and it is anticipated it will take 15- 30 minutes to complete this survey. Once the survey is completed and submitted your obligation to the research will be complete. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Participants may be eligible to receive a $10 e-gift card from Amazon.com for completing the survey; the first 200 people to complete the survey will be eligible to receive an e-gift card. At the end of the survey participants will have the option to provide an email address. The e-gift card will be emailed to the address provided. The email address provided will be stored in a data base separate from the responses of the survey. There will be no way to associate survey responses to the email addresses provided. You must be 18 or older and a personal trainer providing one-on-one personal training services to participate in the study.

There is no direct benefit to you for your participation in this study. There are no foreseeable risks or discomforts to your participation.

All responses will be confidential. We will not collect any personally identifying information as part of the survey. The IP address collection option has been turned off in the survey software as an extra layer of protection. Survey results will be stored in a secure electronic file on a secured computer in the Arizona Biomedical Center at Arizona State University. Only the researchers directly involved in this study will have access to the files. The results of this study may be used in reports, presentations, or publications but individual names will not be used. In any sort of report we make public, all reports will be shared in the aggregate form. Additionally any email address information collected for the distribution of e-gift cards will be stored in a separate data base.

If you have any questions concerning the research study, please contact the research team at: John Preston 602-999-4593 or john.h.preston@asu.edu, or Cheryl Der Ananian at 602-827-2290 or Cheryld@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study

By selecting "yes" below you are agreeing to be part of the study.