Exercise Physiologists in the United States: A 2012 National Survey

Dale R. Wagner

Human Movement Science Program, Utah State University, Logan, UT, USA

ABSTRACT

Wagner DR. Exercise Physiologists in the United States: A 2012 National Survey. JEPonline 2014;17(5):1-10. Exercise physiology is an emerging profession, and exercise physiologists hold prominent positions in healthcare and exercise science, yet demographic data on this profession are lacking. The purpose of this study was to use data from a national web-based survey to describe the educational and professional experience, work setting, and salary of exercise physiologists employed in the United States. An 11-item survey was made available on the Internet during the first 6 months of 2012. An open invitation to all exercise physiologists to take the survey was posted on the American Society of Exercise Physiologists (ASEP) website, and email invitations were sent to exercise physiologists identified from the American College of Sports Medicine (ACSM) membership directory and faculty websites of universities that offer an exercise physiology course. Usable data came from 589 surveys. The sample included 59% male (43.6 ± 11.0 yrs) and 41% female (40.5 ± 11.9 yrs), with the majority employed in universities (60%) or clinical settings (24%). Men gravitated toward careers in academia while women made up the majority of clinical exercise physiologists. Most (57%) had a PhD, and 69% held at least one professional certification. The vast majority of exercise physiologists in academia hold a PhD (85%), while most (69%) working in clinical settings have an MS degree. Although the median salary of the entire sample was $60,000, there was considerable variability depending on the work setting, degree, years of experience, and geographical region of the country employed. Despite a recruitment bias toward ACSM members and those working in academia, this is the first national survey of exercise physiologists and, as such, it sets a precedent for future research.

Key Words: Exercise Physiology, Profession, Salary, Income
INTRODUCTION

The origin and history of exercise physiology is debatable, but the idea that regular exercise promotes one’s health dates back to antiquity. Hippocrates is credited with many statements espousing exercise as a cure for illnesses caused by idleness (10), and the term “physiology of exercise” dates back at least as far as an 1855 publication (4). A substantial volume of physiology research with exercise added to the study designs occurred at the beginning of the twentieth century, and the formation of the Harvard Fatigue Laboratory in 1927 marked a conscious effort to investigate the effects of exercise on the human body (7).

Just as there was not a single moment that defined the birth of exercise physiology, the transition of exercise physiology from a single academic course to an academic discipline and finally a profession has also been an evolutionary process. In a 2003 editorial, Foster (5) stated that the profession of exercise physiologist was born in 1975 with the publication of the Guidelines for Graded Exercise Testing and Prescription (2) because this manual defined a “unique body of knowledge.” According to Boone (3), exercise physiology transitioned from a research discipline to a healthcare profession in 1997 with the founding of the American Society of Exercise Physiologists (ASEP), a professional organization with a code of ethics, standards of professional practice, and boards of accreditation and certification. It has only been since 2010 that the United States Department of Labor has given exercise physiologists a unique occupational classification code, clearly delineating them from physical therapists, athletic trainers, and fitness trainers (11).

Regardless of a clearly defined historical timeline for exercise physiology as a profession, exercise physiologists have been teaching in universities, practicing in clinical settings, and designing exercise programs for clients in entrepreneurial endeavors for decades. Exercise physiologists are one of the largest population subgroups within the American College of Sports Medicine (ACSM) membership directory. There are more exercise physiologists in the ACSM directory than family physicians, orthopedic surgeons, physical therapists, athletic trainers, biomechanists, and cardiologists. Despite the history, prevalence, and prominence of exercise physiologists within the healthcare field, there is a lack of research defining the training and compensation for individuals in this profession.

Selig and Bird (9) reviewed the accreditation system run by the Australian Association for Exercise and Sports Science, but these educational and clinical practice requirements are unique to Australia. Franklin et al. (6) summarized the knowledge, skills, and abilities that clinical exercise physiologists should have in the United States, but there was no assessment or survey done to document what is actually occurring in practice. A 2002 national compensation survey was done on fitness trainers (8), but using the U.S. Department of Labor occupational classification, an exercise physiologist is a substantially different occupation than a fitness trainer. Of greater relevance, the Clinical Exercise Physiology Association (CEPA), an affiliate of ACSM, published a salary survey in 2011 (1). However, the data are specific to exercise physiologists working in a clinical setting and do not include the many exercise physiologists employed in academia, government or military, or entrepreneurial positions.

Thus, the purpose of this study was to use data from a national web-based survey to describe the educational and professional experience, work setting, and salary of exercise physiologists employed in the United States.
METHODS

Subjects and Recruitment
Information requesting exercise physiologists to take the survey and a link to the survey were placed on the ASEP website. Additionally, direct email requests were sent to potential subjects that self-identified as exercise physiologists. This list of potential exercise physiologists came from two sources: (a) web-based directory of academic institutions of higher learning in the United States (http://en.wikipedia.org/wiki/List_of_colleges_and_universities_in_the_United_States); and (b) ACSM membership directory. The website for each college or university in the web directory was searched. If it was possible to determine that an individual was an exercise physiologist from the faculty websites within each university, the person was sent an email invitation to take the survey. Additionally, individuals who self-identified themselves as either “exercise physiologist” or “clinical exercise physiologist” on the ACSM membership directory were sent the same email directing them to the survey. In total, 1,821 email requests were sent.

Survey
From January through June 2012, an 11-item survey was made available on Kwik.surveys.com. The 11 items on the survey were sex, age, region of the country employed (9 options), highest degree earned, year in which the highest degree was awarded, employment category or work setting (academia, fitness industry, clinical, government, or entrepreneurial), years employed in current exercise physiology position, total years employed as an exercise physiologist, annual income, active membership in professional organizations, and professional certifications held.

Statistical Analyses
The Statistical Package for Social Sciences (SPSS, version 22, IBM, Armonk, NY) was used for all analyses and graphs. Statistical significance was set at $P \leq 0.05$. Frequency distributions, means, and standard deviations were calculated for descriptive purposes. The Generalized Linear Model (GLM) was used to determine which variables significantly contributed to salary.

RESULTS

Entire Sample (N = 589)
Six hundred and three surveys were submitted. However, in several instances the respondents noted that their profession was something other than an exercise physiologist (e.g., athletic trainer, physical therapist) or they indicated no salary from exercise physiology employment. These respondents were deleted, leaving a sample size of 589 with 59% male (43.6 ± 11.0 yrs) and 41% female (40.5 ± 11.9 yrs).

The median salary for the entire sample was $60,000, with a mean salary of $62,000 ± 26,344. The salary variable failed the Shapiro-Wilk test of normality ($P<0.001$). However, visual inspection of the data revealed a fairly normal distribution with a few high salaries pulling the tail of the curve slightly to the right. As might be expected, salary was significantly ($P<0.001$) and highly correlated with age, the year in which the highest degree was earned, the number of years in the current position, and the number of years as an exercise physiologist (Table 1). Also, salary differed significantly dependent on the highest degree held ($F = 85.5$, $P<0.001$) (Figure 1).
Table 1. Correlation Coefficients for Continuous Variables Significantly (P<0.01) Correlated with Salary.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Age</th>
<th>Year Degree was Earned</th>
<th>Years in Current Job</th>
<th>Years as an EP</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>---</td>
<td>-.858</td>
<td>.689</td>
<td>.859</td>
<td>.504</td>
</tr>
<tr>
<td>Year Degree was Earned</td>
<td>---</td>
<td>-.728</td>
<td>-.877</td>
<td>-.486</td>
<td></td>
</tr>
<tr>
<td>Years in Current Job</td>
<td>---</td>
<td>.755</td>
<td></td>
<td>.492</td>
<td></td>
</tr>
<tr>
<td>Years as an EP</td>
<td>---</td>
<td>.563</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EP = Exercise Physiologist

Figure 1. Annual Income from Exercise Physiology Employment by Degree. Data are means and error bars represent ±1 SD.

Nearly all (98%) reported being members of at least one professional organization (Table 2), and 51% were members of at least two organizations. At least one professional certification was held by 69% of the sample, and 28% held two or more certifications. The majority (57%) held a doctorate degree, 34% had a master’s degree, and 9% were employed as an exercise physiologist with a bachelor's degree.
Table 2. Professional Affiliations of Exercise Physiologists.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Number</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Society of Exercise Physiologists (ASEP)</td>
<td>32</td>
<td>5.4%</td>
</tr>
<tr>
<td>American College of Sports Medicine (ACSM)</td>
<td>523</td>
<td>88.8%</td>
</tr>
<tr>
<td>Clinical Exercise Physiology Association (CEPA)</td>
<td>63</td>
<td>10.7%</td>
</tr>
<tr>
<td>American Physiological Society (APS)</td>
<td>85</td>
<td>14.4%</td>
</tr>
<tr>
<td>National Strength &amp; Conditioning Association (NSCA)</td>
<td>159</td>
<td>27.0%</td>
</tr>
<tr>
<td>Other</td>
<td>114</td>
<td>19.4%</td>
</tr>
</tbody>
</table>

Note. The total is not 589 or 100% because many subjects were affiliated with more than one organization.

Sixty percent of the sample was employed in academia, and 24% worked in a clinical setting. The remaining 16% were fairly evenly distributed among positions in the fitness industry, the government, and entrepreneurial ventures. Given the relatively low numbers in these three categories of employment, and the impact that the work setting variable has on salary, the subsequent generalized linear model analyses were done on only the subsamples of exercise physiologists employed in academia and clinical settings.

Academia (N = 349)
Of the subsample of exercise physiologists employed in academia, 70% (N = 245) were male and 30% (N = 104) were female. The majority held a PhD (85%), with 13.5% and 1.5% reporting their highest degree as a master’s or bachelor’s degree, respectively. Sixty-three percent reported having a current professional certification. The median salary of this subgroup was $66,000, with a mean salary of $68,528 ± 25,869.

The GLM was used to determine the factors that significantly affect salary of exercise physiologists working in academia, with salary the response variable, and sex, geographical region, highest degree held, and having or not having a current professional certification as predictor categorical variables. Given the high and interrelated correlations between age, the year in which the highest degree was earned, years in current position, and years as an exercise physiologist (Table 1), only the years as an exercise physiologist was used as a continuous variable predictor. Thus, the variables in the tested model to predict salary were years as an exercise physiologist, highest degree held, geographical region of employment, sex, if a professional certification was held, and the interaction between sex and years of experience. Only years as an exercise physiologist (P<0.001), degree (P<0.001), and geographical region (P = 0.001) were significant. A graphical representation of annual income by degree and sex is presented in Figure 2, while the relationship between salary and years employed as an exercise physiologist is depicted in Figure 3.
Figure 2. Salary Comparisons by Sex and Degree for Exercise Physiologists Employed in Academia. Data are means and error bars represent ±1 SD.

Figure 3. Relationship of Salary to Years of Experience with Consideration Given to Degree for Exercise Physiologists Employed in Academia.
Clinical (N = 140)
The majority of exercise physiologists employed in clinical settings were females (63%). Most clinical exercise physiologists (69%) held a master’s degree. Only 8% earned a PhD, while 23% were employed with a bachelor’s degree. The vast majority of exercise physiologists working in this setting (82%) self-reported holding at least one professional certification. The median salary for clinical exercise physiologists was $45,000 with a mean salary of $49,357 ± 17,652.

The same variables and model described previously for the GLM analysis for academia were used for the GLM analysis of clinical exercise physiologists. The results were similar to those observed for academia in that years of experience as an exercise physiologist (P<0.001), degree (P = 0.008), and geographical region employed (P = 0.036) were all statistically significant factors of salary while sex, the sex x experience interaction, and certification held were not significant. The influence of sex and degree on salary is depicted in Figure 4. The relationship between years of experience and salary is shown in Figure 5.

![Figure 4. Salary Comparisons by Sex and Degree for Exercise Physiologists Employed in Clinical Settings. Data are means and error bars represent ±1 SD.](image-url)
DISCUSSION

This is the first national survey to describe the educational qualifications, professional experience, and salary of exercise physiologists from a variety of occupational settings. CEPA previously conducted a national survey, but this was limited to clinical exercise physiologists (1). CEPA reported that 67% of clinical exercise physiologists held a master’s degree and 26% had a bachelor’s degree. This was nearly identical to the exercise physiologists who reported being employed in clinical settings in the present study, with 69% having a master’s degree and 23% a bachelor’s degree. Similarly, the salary data were almost identical. CEPA reported a median salary range of $47,501-$50,000. The mean salary for clinical exercise physiologists in the present study was $49,357 with a median salary of $45,000. Additionally, both the current study and CEPA observed an increase in salary with experience. Thus, based on this limited data, there appears to be good reliability and content validity of the current study.

There is an inherent bias in the current study toward exercise physiologists who work in academia and those who hold a membership in the ACSM because of how the participants were recruited. Targeted email invitations were sent to individuals who were identified as exercise physiologists through their respective university web pages. Additionally, individuals within the ACSM membership directory who self-reported being either an exercise physiologist or a clinical exercise physiologist were sent an email invitation to take the survey. This recruitment bias toward exercise physiologists working in academia and clinical settings led to relatively few responses from entrepreneurs and those employed in the fitness industry or in government positions. The majority of the exercise physiologists employed in these three settings has a master’s degree and professional certifications.
However, due to the small number of survey participants from these work settings, it was deemed prudent to exclude them from advanced statistical analyses (e.g., GLM) and not speculate about the many factors that may influence their salary.

When considering exercise physiologists who work in academic and clinical settings, several comparisons are striking. First, 70% of the exercise physiologists in academia are male, yet this disparity is almost completely the opposite in clinical settings with the overwhelming majority (63%) being female. Second, the PhD degree appears to be almost a necessity for exercise physiologists in academia with 85% having completed the degree. In contrast, the majority of clinical exercise physiologists (69%) are employed with a master’s degree. Although the majority of respondents in both work settings hold professional certifications, this appears to be more of an employment criteria for clinical exercise physiologists than those in teaching or research positions. The salary was substantially higher for exercise physiologists in academia compared to clinical exercise physiologists, but this can also be attributed to the disparity between PhD-prepared exercise physiologists concentrated in academia compared to MS and BS exercise physiologists working primarily in clinical settings. There was also a significant salary difference between men and women, however, when other influential factors such as degree, years of experience, and geographical region of the country employed were considered in the GLM the sex difference disappeared.

CONCLUSIONS

Based on the data from this sample, exercise physiologists are highly educated with 91% holding a graduate degree, and more than two-thirds have additional professional certification. They are also actively engaged in professional activity with nearly all being members of at least one professional organization and more than half belonging to at least two. There are more men than women in this profession, and there is a clear gender distinction for occupational setting; females tend to work in clinical settings while males work in academia. Also, the vast majority of exercise physiologists working in universities have PhD degrees while most working in clinical settings have a master’s degree. Overall, the median salary for exercise physiologists is $60,000, but this varies considerably dependent on the degree held, years of experience, occupational setting, and geographical region employed.

Despite the recruitment bias toward exercise physiologists in academia and clinical settings, this is a valuable and worthwhile analysis in the continuing evolution of exercise physiology from an academic discipline to a profession. It is the first nation-wide survey of this unique population, and it provides the first scientific quantification of the income, educational training, and professional experience of exercise physiologists in the United States. As such, this study sets a precedent and provides historical data for future surveys. Future surveys should target subgroups of exercise physiologists and/or clearly define employment settings (e.g., exercise physiologists employed as government research scientists, or exercise physiologists employed in the design and development of fitness equipment or apparel), as it is clear from this initial survey that the degree requirements, professional certifications, training, and salary differ considerably among this heterogeneous group of individuals known collectively as exercise physiologists.
ACKNOWLEDGMENTS
Thanks to the Human Movement Science Program at Utah State University for funding the publication costs. Thanks to the exercise physiologists who took the time to complete the survey.

Address for correspondence: Dale R. Wagner, PhD, Human Movement Science Program, HPER Dept., Utah State University, 7000 Old Main Hill, Logan, UT, USA, 84322-7000. Phone: (435) 797-8253, Email: dale.wagner@usu.edu

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