Clinical Exercise Physiology Accreditation: An Audit of Existing Standards

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ABSTRACT

Background: Health professions such as clinical exercise physiology are founded on a set of standards that outline base level knowledge, skills, and competencies to define the roles and scope of practice of the profession. Despite the practice of clinical exercise physiology having many common features regardless of the country in which it is conveyed, a harmonized set of international standards does not exist. The aim of this study was to systematically audit the professional standards for the 5 countries recognized as having existing national certification systems for clinical exercise physiology.

Method: The audit process was conducted using a modified scoping review protocol based on the documentation provided by the American College of Sports Medicine, Exercise and Sports Science Australia, British Association of Sport and Exercise Sciences, Canadian Society for Exercise Physiology, and Sport and Exercise Science New Zealand. Two reviewers independently extracted data from the standards documents, and results were cross-checked by relevant experts from each jurisdiction.

Results: Commonality of themes was found for 60% of all content extracted. The overall coverage of themes was 60%, 67%, 76%, 88%, and 98% from New Zealand, Canada, the United States, the United Kingdom, and Australia, respectively.

Conclusion: A common core of themes is covered by all current national standards for clinical exercise physiology across the 5 nations audited but only variable coverage in the remaining 40%. These findings are important for understanding the differences in current training and certification of clinical exercise physiology professionals and how this might influence the internationalization of the profession.

Keywords: international standards, accreditation standards

INTRODUCTION

The practice of clinical exercise physiology is well recognized for the profound impact it can have on preventing, treating, and managing many of the health burdens faced in contemporary society (1–4). The modern-day clinical exercise physiologist (CEP) is increasingly becoming an integral part of the allied health team, with robust evidence-based interventions forming the basis of service provision across an ever-increasing range of pathological domains (5–7). The inclusion and subsequent impact of the relatively new discipline of clinical exercise physiology in the health care landscape can be attributed to well-considered and curated standards that underpin the practice of professionals in this space.

Standards in a broader health care context are defined as minimum practice preconditions for health care professionals (8) and set out the threshold requirements necessary to protect the public (9). They help to provide consumers with the confidence that the service they receive is safe, reliable, consistent, and of acceptable quality. Standards represent a formula that describes the best way of providing a service and are the distillation of the collective wisdom of subject matter experts (10,11).

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Clinical exercise physiology competency standards set minimums for practitioner knowledge, skill, and competencies to be safe and fit to practice (12–16). Competency standards can underpin professional regulation systems and/or unit of study accreditation. In the latter, education providers construct study programs to address the competency standards and apply for program-level accreditation. Satisfying a professional body's standards at this level provides assurances to enrolled students that successful completion of the unit of study will see them meet thresholds ultimately permitting them to practice as a CEP. Recognition of this attainment by relevant professional organizations, in some cases through the passing of an individual-level exam as well, can afford the CEP the right to be conferred, to adopt a recognized professional title, and to access specific employment opportunities and/or health and medical compensable scheme rebates.

Notwithstanding the seemingly common purpose of entry-level thresholds for CEP practice, the harmonization of competency standards by professional and accrediting bodies around the globe (e.g., American College of Sports Medicine [ACSM], British Association of Sport and Exercise Sciences [BASES], Canadian Society for Exercise Physiology [CSEP], Exercise and Sports Science Australia [ESSA], and Sport and Exercise Science New Zealand [SESNZ]) has not eventuated. Evidence exists of professional bodies referencing competency standards deployed in other jurisdictions, but outside the occasional bilateral convergence, no international or multijurisdictional leadership has arisen, let alone a beacon on which new and emerging professional CEP bodies can rely.

The key function competency standards can play in advancing clinical exercise physiology on a domestic level are evident. In countries where clinical exercise physiology arguably has a more advanced public recognition and is firmly embedded in health care systems, these standards are evolving to ensure CEPs have the skillset to practice in new and emerging areas (15). In countries where clinical exercise physiology is yet to be fully realized in the health system, the efforts underway to have CEPs recognized and accredited as allied health professionals are founded in large part on the quality of these standards (11). With commentary in the field making declarations such as "the momentum of the clinical exercise movement is palpable around the world" (17) and "accreditation is a necessary step to move the clinical exercise physiology profession forward" (11), a clear opportunity exists to explore whether a common set of international CEP competency standards can be established.

In 2020, the leadership of ACSM, BASES, CSEP, ESSA, and SESNZ agreed to establish an international alliance with the purpose of advancing the practice of sport and exercise sciences (18). The International Confederation of Sport and Exercise Science Practice (ICSESP) adopted a vision to positively impact individuals, communities, and countries by advancing the international practice of the sport and exercise sciences. Pursuant to one of its strategic pillars, the ICSESP committed to establishing and adopting an international set of standards for CEPs. A working group of the ICSESP Board commenced the task of realizing an international set of standards in May of 2021. Beginning with an environmental scan of foundation member competency standards and a search for previously used benchmarking methodology in cognate health care disciplines, the working group then turned to auditing the competency standards of ICSESP these 5 organizations.

This paper describes the document audit process used to compare the CEP accreditation standards of foundational member organizations of the ICSESP. In addition to providing important insight into CEP standards across countries, it represents the first step in what is anticipated to be the process of achieving a common set of internationally adopted CEP competency standards.

METHODS

Overview

In the absence of any identified accepted protocol suited to the specific aims of this study and to optimize rigor and minimize bias, this document audit has been modeled on the established approach for conducting a scoping review as described by Peters et al (19). Importantly, this study is not intended to be a scoping review, but rather, we adapt these established principles to enhance the rigor and minimize bias in the derived outcomes. Key differences in this study from a typical scoping review are no need for a systematic search of peer-reviewed literature and no sample population of focus. The guidance around protocol design and data extraction have therefore been applied as appropriate. Notably, the research question and document eligibility were defined a priori, and data extraction was undertaken by 2 independent reviewers. The most significant variance between this study design and a typical scoping review protocol was no need for screening of peer reviewed literature due to the relevant documents being readily available from the 5 accrediting bodies.

Protocol Registration

This document audit protocol has been registered a priori on an open-access research platform (Open Science Framework: https://osf.io/dxkvh/).

Research Question

In this document audit, we aim to report on the question of what similarities and differences exist across the standards that define the clinical exercise physiology criteria for accreditation/certification across 5 countries (Australia, Canada, New Zealand, the United Kingdom, and the United States).

Population, Concept, and Context

The equivalent of a population sample for this process is the selection of the national organizations' respective sets of standards for inclusion. This was determined to be the 5 nations known to have a new or existing accreditation or certification system for clinical exercise physiology: Australia, Canada, New Zealand, the United Kingdom, and the

United States. The concept is the description of standards for determining an individual's suitability to be recognized as a CEP. The context is national accreditation or certification programs to qualify CEPs as allied health professionals in each respective country.

Search Strategy and Evidence Screening

The search strategy involved directly seeking the current documentation from each national professional body in the 5 selected nations. No document screening was required in this context.

Data Extraction

Two independent reviewers undertook the data extraction. All statements of professional standards deemed to define the criteria for accreditation or certification in each respective country were extracted from each set of standards and entered into a purpose-designed Microsoft Excel spreadsheet (Microsoft, Redmond, Washinton).

Data Analysis and Presentation

To structure the comparison, the competency standards from one organization, ESSA, was used as a base framework for cross-comparison in a Microsoft Excel spreadsheet. Individual items from each set of standards were then entered into the spreadsheet against the corresponding topic in the base framework and thus identified as consistent with the respective item, partially consistent, or identified as a new item not contained in the existing framework. Additional items identified from any subsequent standards not present in one or more of the already entered sets of standards were then added under the relevant section heading for comparison. This continued in an iterative manner until all individual items from all standards had been entered and all levels of alignment or lack of alignment identified.

The reason for using the ESSA standards as the base framework is twofold: first, the recognition and implementation of the clinical exercise physiology profession as an integral part of the health system is arguably most advanced in Australia, and the ESSA (2021 version) had just been recently updated to reflect the most contemporary professional competencies of clinical exercise physiology in this context. The second is pragmatic: the primary reviewers (N.R., C.R.) are Australian based so are most familiar with this framework, thus making the process more intuitive to work from this perspective. Both primary reviewers are qualified CEPs with extensive experience in the development and implementation of professional standards across the broad exercise and sports science field, specifically in clinical exercise physiology. To ensure the interpretation of standards was accurate across all countries, additional secondary independent reviewers with content- and context-specific expertise for one of the other sets of standards were recruited from each country. The credentials of the secondary reviewers were as follows: ACSM, Director ACSM Certification and Credentialing Board; BASES, Member Clinical Exercise Physiology—UK, member of the CEP-UK standards development working group; CSEP, Director CSEP Board and CSEP Professional Standards Committee Member; and SESNZ, Member SESNZ Board. These secondary independent reviewers reassessed the application of their respective standard for accuracy. Any discrepancies in extraction and/or interpretation between the 2 primary reviewers or the primary and secondary reviewers were resolved through discussion (either verbal or written) to their mutual satisfaction.

Against each criterion within the extraction framework, a column represented each national professional body, and a note made as a tick, cross, or both represented whether the item was included, not included, or incomplete in the respective national standard document. This was supplemented with any relevant comments to contextualize the decision by the reviewer. Thus, the presentation of data for analysis and reporting was the collective decision of the reviewers with any relevant comments and then inclusive of the outcomes of each national standards expert reviewer.

The data were presented as a descriptive summary comparing the standards documents from each organization. This was supplemented with a narrative synthesis that explored trends and patterns across the 5 sets of standards.

RESULTS

All 5 identified countries had eligible standards for inclusion. Four of 5 standards, specifically those for Australia, Canada, New Zealand, and the United States were contained in a single document and were administered entirely by the respective national peak body for exercise and sports science. The United Kingdom standards were the most recent, completed only in the same year of this review, and jointly developed and administered by the peak national body (BASES) and a newly developed organization CEP-UK. The UK standards also differed in that they comprised 2 documents, 1 that covered generic health practice elements and 1 that covered CEP specific elements. Both documents were considered in the audit extraction and analysis. Table 1 details the documents included.

Four domains and 19 discreet themes were identified from the Australian standards to create the base framework for analysis, and a further 2 discreet themes were added from the other sets of standards, resulting in a total of 21 themes for comparison. The median number of standards that covered each theme across the 21 themes was 3 with an interquartile range (IQR) of 2. The domains of *assessment and client management* and *design and delivery of evidence-based interventions* had higher agreement, both with medians of 4 and IQRs of 1. Figure 1 shows the domains and themes within each domain, and the color coding shows the level of agreement across sets of standards for each theme.

The level of coverage of the themes varied greatly across the sets of standards. The supplemental online file CEP Standards Audit (accessible via https://icsesp.global/) shows the coverage of each theme by each set of standards. Considering both partial and full coverage for each theme, the Australian and United Kingdom standards showed the highest coverage with 98% and 88%, respectively. The least

TABLE 1. Clinical exercise physiology professional standards in International Confederation of Sport and Exercise Science Practice foundation member organizations.

	Australia (ESSA)	Canada (CSEP)	New Zealand (SESNZ)	United Kingdom (BASES)	United States (ACSM)
Clinical exercise physiology accreditation standards	ESSA Accredited Exercise Physiologist	CSEP Certified Clinical Exercise Physiologist	SESNZ Accredited Exercise Physiologists	Clinical Exercise Physiology UK—Clinical Exercise Physiology Curriculum Framework Statement; RCCP Standards of Proficiency Clinical Physiologists—Standards of Proficiency	ACSM Certified Clinical Exercise Physiologist

ACSM = American College of Sports Medicine; BASES = British Association of Sport and Exercise Sciences; CSEP = Canadian Society for Exercise Physiology; ESSA = Exercise and Sports Science Australia; RCCP = Registration Council for Clinical Physiologists; SESNZ = Sport and Exercise Science New Zealand

agreement was from New Zealand and Canada with 60% and 67%, respectively, and the United States standards covered 76% of the identified themes. As noted above, coverage was generally more consistent in the assessment and client management and design and delivery of evidence-based interventions themes with 3 out of 5 sets of standards covering 100% of items in these 2 domains. Additionally, the highest level of coverage for the New Zealand standards (80%) was in design and delivery of evidence-based interventions and for the Canadian standards (83%) in assessment and client management.

DISCUSSION

In this paper, we have taken a novel approach to summarize and contrast a set of qualification standards for clinical exercise physiology from across the 5 countries that are recognized as having a national qualification framework for this profession. The CEP standards of ESSA were used as a base framework for the cross-comparison, as a widely held view is that Australia has an advanced public and professional recognition of their clinical exercise physiology and that CEPs in Australia are integrated into the health care system beyond any other of the 4 participating jurisdictions (17). The adoption of a systematic approach and 2-stage verification with duplicate independent extraction and analysis followed by jurisdictional expert referral provides confidence in the veracity of the reported findings. Understanding the role of the CEP in a global context requires a degree of collective understanding of what a CEP can do, and this is directly informed by the standards that underpin the profession. Thus, the respective standards offer an important vehicle to compare the practice of CEPs between countries.

Overall, greater than 60% commonality was found in the standards assessed. Considering the level of recognition of clinical exercise physiology, the scope of practice, and the practice opportunities for CEPs differ greatly between the 5 countries and the fact that, for the most part, the setting of standards is done without international collaboration or direct comparison, this is a relatively high level of agreement. The clear exception to the setting of standards without international collaboration is the newly developed standards in the United Kingdom, whereby these were modeled closely on the Australian system, with expert collaborators from Australia included in the CEP-UK working committee (17). The Australian standards had the highest coverage across all themes, with *demonstrate emergency procedures* the only theme identified across all standards that was not fully covered. This relatively high coverage of the Australian standards is likely due to 2 main factors. Firstly, it is generally accepted that the clinical exercise physiology profession is the most broadly established within the Australian health care system relative to other countries (20), and secondly, the Australian standards that were included in this audit were recently reviewed (2021) and updated to contemporary practice standards and expectations.

The *professional practice* domain had the greatest variability in coverage. Generally, the themes covering more medicolegal aspects of practice had very high coverage across the standards. Comparatively, the themes that related more to the approach to practice, such as *cultural safety*, *client centeredness*, and *reflective practice*, were less consistently covered. Interestingly, the theme encompassing emergency procedures, which may be considered at the more fundamental, medicolegal level, also showed lower coverage with only 2 standards covering this theme. If the practice of clinical exercise physiology is to elevate its recognition internationally and assert its place as a leading discipline ready to meet worldwide current and emerging health challenges, a universally accepted base-level practice and conduct framework is critical. The United States was seen as one country where the addressing of ethical practice was less well represented within standards documentation. During this audit, the authors were made aware of ACSM's intentions to introduce requirements for increased awareness of ethical practice principles for new and/or existing ACSM CEPs. New Zealand was identified as having extensive reference to practicing in a culturally safe, inclusive, sensitive, and respectful way, giving particular attention to First Nation peoples. With the World Health Organization recognizing the importance of cultural competency as the facilitator of

inclusive health systems (21), the beacon provided by New Zealand's standards should be dutifully considered as part of any standards harmonization at an international level.

Within the *foundational knowledge* domain, somewhat contrastingly the themes that may be seen as more fundamental such as those covering understanding of relevant medical conditions and how exercise and other treatments may influence them, was the least covered. While all standards had significant content on these topics, the differences were in the level of coverage and particularly the scope of conditions

Standard Domain	Theme								
Professional Practice	Practice within SoP, Code of Conduct and Ethical Practice	Practice in accordance with legislation, regulations and standards	Develop effective, concise, respectful and informative clinical documentation	Practice in a culturally safe, inclusive, sensitive and respectful way and according to person-centred care principles		Practice collaboratively with other professionals	Develop reflective practices	Demonstrate emergency procedures	Demonstrate leadership and ability to advocate for client access
Foundational Knowledge	Examine principles of biopsychosocial care, value-based care, person-centred care and cultural determinants of health and apply this to promote health and well-being for individual clients and population groups	Explain national, state and compensable scheme frameworks across the health care, aged care and disability sectors, and the requirements for AEPs working in these settings	Evaluate and apply contextual learning principles and behaviour change strategies to improve health outcomes, increase engagement, motivation and adherence and empower self-management of health conditions	Evaluate the effect of commonly prescribed medications, diagnostic procedures, medical, surgical, and other interventions on both resting and exercise-related psychological responses across the full health spectrum		Integrate foundational knowledge and apply these to inform safe and effective movement, physical activity and exercise-based interventions for individuals and population groups throughout all stages of their life			
Assessment & Client Management	Formulate appropriate screening processes to evaluate and stratify risk	Distinguish, record, report, and appropriately action changing risk factors and adverse signs and symptoms that may arise before, during, and after assessments and interventions		Distinguish and communicate appropriate client support to effect service delivery including onward referral and using various modalities to communicate					
Design & Delivery of Evidence-based Interventions	Formulate and apply strategies to manage risk, evaluate progress and adapt recommendations and interventions	Design, prescribe, deliver and monitor safe and effective movement, physical activity and evidence-based interventions for clients with complex presentations	Formulate evidence-based exercise prescription, interventions and recommendations that address health and treatment related client needs	Create and apply communication strategies to educate and engage clients	Formulate strategies during treatment to empower clients				

FIGURE 1. Four standards domains of clinical exercise physiology and themes. Color coding shows the level of agreement across the 5 sets of standards with deep green indicating 5/5, lighter green 4/5, yellow 3/5, orange 2/5, and red 1/5.

and population demographics covered. Encouragingly, however, the themes covering the approach to practice in this domain, including the ability to examine and apply principles of biopsychosocial and person-centered care and to apply principles of behavior change in practice, had near or complete agreement across standards. The audit process revealed a variance in the definition of *value-based care* between jurisdictions and that not all countries connected with it, representing an opportunity for clinical exercise physiology standards to be equipped to satisfy regulatory bodies into the future. The theme of *explaining national, state, and compensable scheme frameworks across the health care, aged care, and disability sectors, and the requirements for working in these settings* was not addressed in Canada, the United States, or the United Kingdom, with partial inclusion in New Zealand.

The audit of the assessment and client management standards domain unveiled a high degree of homogeneity between countries across the 3 themes. All themes were covered to some extent by all; however, Canada and New Zealand were identified as only partially exploring communication and referring via various modalities. The design and delivery of evidence-based interventions domain also showed generally good consistency across standards. The themes of *formulating evidence-based exercise prescription, interventions, and recommendations that address health- and treatment-related client needs* and *designing, prescribing, delivering, and monitoring safe and effective movement, physical activity, and evidence-based interventions for clients with complex presentations* were viewed as consistent in Australia, Canada, the United States, and the United Kingdom. New Zealand was rated as partially consistent because, outside musculoskeletal conditions, the theme was not linked to any pathophysiological categories. The theme of *formulating and applying strategies to manage risk, evaluate progress, and adapt recommendations and interventions* was consistent across all 5 countries. Australia, the United States, and the United Kingdom all included the remaining themes. Canada and New Zealand were partially consistent or not consistent because no evidence was found of educating, engaging, and empowering clients across the assessment to the treatment continuum.

Due to its nature, this audit does not uncover the underlying reasons for any identified differences in the results reported. It can be speculated, however, that differences in scope and context of practice between countries may be a contributing factor. Roles of CEPs vary between countries and health insurance funding for services, and health system employment practices play a significant role in this. For example, in 2015, in the United States, 45% of CEPs worked in cardiac rehabilitation services, with the remaining 55% spread over a range of service contexts including commercial fitness centers, corporate wellness, and cardiovascular stress testing (2). Contrastingly, in Australia, at the same time, it was estimated that less than 2% of CEPs work directly in cardiac rehabilitation (22). It is also important to note that the role that standards play in the education, accreditation, certification, and development of the profession likely varies between countries. This is expected to influence the content and structure of standards documents and may also explain differences identified in this audit. If national bodies are moving toward greater harmonization of standards internationally, it will be important to understand and account for these differences.

The authors of this paper acknowledge that additional limitations exist and should be considered in the context of the documented findings. The 2 independent reviewers who undertook the data extraction emanated from Australia. As such, while abundant care may have been exercised to not take a biased view, their elevated familiarity with the Australian standards may have prejudiced the findings. The potential for bias was, however, mitigated using secondary reviewers from each of the other 4 respective countries to validate the extraction and interpretation of the original reviewers. It is also important to note that other standards for CEPs are administered by alternate national or regional organizations in some of the countries, for example, the American Association of Cardiovascular and Pulmonary Rehabilitation, that have not been included in this audit. Additionally, this audit has not considered the standards of other organizations in the participating countries that also represent clinical exercise physiology and similar professions that may overlap with clinical exercise physiology in those countries. One example of this is biokineticists in South Africa which have an accreditation system in place through the Biokinetics Association of South Africa.

CONCLUSION

The audit described in this manuscript represents the first time standards in clinical exercise physiology have been compared. The authors have identified standards that are common across CEP accreditation in foundational member organizations of the ICSESP. Additionally, in this audit, we have illuminated opportunities for which standards could be strengthened in some member organizations. The findings of the audit set the scene for the next phase in developing a core set of CEP standards for current and prospective ICSESP members. The ICSESP has proposed to develop an internationally recognized core set of competency standards for clinical exercise physiology, and it is anticipated that this standards audit can help inform that process.

Contributorship

Mr Nathan Reeves was the lead author of this expert commentary, generating the substantial portion of the article. Carly Ryan contributed to the preparation of the data and early reviewing of the data. Associate Professor Kade Davison analyzed the audit findings and contributed heavily to the writing, review, and editing of the article.

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