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Contextualizing Aquatic Rehabilitative Practices in Canada

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I understand that as the author, I am solely responsible for any errors or omissions in the thesis, including, but not limited to, spelling, grammar, data analysis, or citation errors.

ABSTRACT

This thesis explored the current context of aquatic rehabilitative practices in Canada. More specifically, three inter-related topics on Aquatic Therapy (AT) and Aquatic Physical Therapy (APT) in Canada were examined: 1) the development of knowledge, training and expertise on APT and AT, 2) recognition and acceptance of cultural and social authority on AT and APT (Starr, 1982), and 3) the practitioners' perceptions of barriers to practicing and participation in aquatic therapy. Semi-structured qualitative interviews were conducted with seven (7) stakeholders including Ontario aquatic physical therapists, aquatic therapists, instructors on aquatic therapy and members of the College of Physiotherapy of Ontario (CPO) and the Canadian Physiotherapy Association (CPA). Interviews were complimented with open-ended questionnaires sent to Chairs of Physical Therapy programs in seven Canadian Universities.

Our research identified the most common means of acquiring knowledge on aquatic rehabilitative practices was through University Physiotherapy program curriculum; private training courses; and in-house within facilities where aquatic therapists and aquatic physical therapists are employed. This thesis also examined facilitators/barriers to practicing and receiving aquatic therapy and aquatic physical therapy. Through critical analysis, this thesis reflected on the ways in which social and cultural authority (Starr, 1982) are constructed within the field of aquatic therapy (AT) and aquatic physical therapy (APT). Recommendations and areas for future research included specialized training courses by scope of practice, and increased in-pool practicum training within Physiotherapy programs in Canada.

KEY TERMS

APT – Aquatic Physical Therapy

APTA – American Physical Therapy Association (Located in Virginia. Home to the Aquatic Physical Therapy Section of APTA)

APTI – Aquatic Physical Therapy International (Based in Switzerland and affiliated with the World Confederation for Physical Therapy)

ATACP - Aquatic Therapy Association of Chartered Physiotherapists (Based in the United Kingdom)

ATRI – Aquatic Therapy and Rehab Institute (Based in Florida, primarily for US market)

AT – Aquatic Therapy

CARI - Canadian Aquatic Rehabilitation Institute (Based in Toronto)

CALA – Canadian Aquafitness Leaders Alliance (Based in Toronto)

CPA - Canadian Physiotherapy Association (Based in Ottawa)

CPO – College of Physiotherapists of Ontario (Based in Toronto)

LBPT – Land-based Physical Therapy

MVA – Motor Vehicle Accident

PT – Physical Therapy

WCPT - World Confederation for Physical Therapy (Based in the UK)

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CHAPTER 1: PARAMETERS OF THE STUDY: LITERATURE REVIEW, THEORETICAL AND METHODOLOGICAL FRAMEWORK

Water has been a healing medium for several millennia. Mineral waters, sea water, hot springs and public baths have offered healing properties and therapies from civilizations during the pre-historic and Ancient periods that continue today (van Tubergen & van, 2002). During the last century in Canada, these healing practices expanded from a passive immersion in water, to include a research-based therapeutic program involving intentional movement and physical therapeutic manipulation. The natural physical properties of water (buoyancy and viscosity) as well as the warm water temperature allow water to compliment land-based physical therapy to treat patients' illness or injury-related symptoms (Becker, 2009; Brody & Geigle, 2009). In the past thirty (30) years, there has been a shift towards developing expertise on how to maximize physiological benefits and recovery through effectively implementing various forms of water-based therapies. The thesis will explore the current status of aquatic physical therapy (APT) in Canada, focusing on aspects related to education, training, and practice.

Background

According to the most recent Canadian 2016 Census, there are more citizens over the age of 65 than there are children under the age of 14. There are 5.9 million Canadian seniors, of which 89% reported at least one chronic health condition (Statistics Canada, 2016a; Statistics Canada, 2016b; Canadian Institute for Health Information, 2011). Canadians are living longer than ever, and as the elderly population grows and baby boomers become senior citizens, it is expected that one in four Canadians will be over the age 65 by 2036 (Statistics Canada, 2016a,

Canadian Institute for Health Information, 2011). Caring for this population and their chronic conditions will continue to be an important focus within Canadian health care. Chronic conditions are any disease, physical injury or lack of physical capability that persists for more than three months (Perrin, Newacheck, Pless, & Drotar, 1993).

Rehabilitation for most common chronic conditions is offered through many modalities including land-based physical therapy (LBPT) and aquatic physical therapy (APT). The use of water as a setting for rehabilitation is unique in its ability to treat conditions with balance disorders, weight-bearing concerns and other complications in which the land environment proves inaccessible or challenging (Prins, 2010, Wilk & Joyner, 2014, Becker, Brody & Geigle, 2009). Rehabilitation in aquatic settings can be effective in treating chronic conditions and lessening patients' symptoms (Wolski, 2007; Volpe, et al 2014; Leslie, 2006; Prins, 2010, Wilk & Joyner, 2014). However, some researchers find that aquatic physical therapy is underused for populations that would benefit (Brody & Geigle, 2009; Becker, 2009), and this thesis will explore why.

It is important to differentiate between aquatic physical therapy, aquatic therapy and other water based exercise programs such as aqua-fitness or aqua-aerobics. Registered physical therapists can work in the aquatic environment performing exercise, movement and manipulation which are referred to as Aquatic Physical Therapy (APT). Following the definition provided by the World Confederation of Physical Therapy (WCPT), Physical Therapists, be it land-based or aquatic, are defined as: "providing services that develop, maintain and restore people's maximum movement and functional ability. They can help people at any stage of life, when movement and function are threatened by ageing, injury, diseases, disorders, conditions or environmental factors" (WCPT, 2016). Through therapy, the goal is to either increase or

decrease a physical trait, for example, range of motion, inflammation or strength. The physical therapist is able to: develop treatment plans, measure outcomes, improve physical function, assess improvement and eventually discharge the patient. As defined by the Aquatic Therapy Association of Chartered Physiotherapists (ATACP), aquatic physical therapy is “A therapy program utilizing the properties of water, designed by a suitably qualified physiotherapist specifically for an individual to improve function, carried out by appropriately trained personnel, ideally in a purpose built, and suitably-heated hydrotherapy pool”¹(ATACP, 2008).

APT is performed by a qualified physiotherapist and is ideally practiced in a purposefully built facility that has proper equipment, water depth, and support structures. In Canada, an APT must be registered with their respective provincial regulatory college. Aquatic physical therapy is provided in a suitably-heated pool which ranges from 91-93degrees Fahrenheit; whereas aquatic therapy (AT) can be performed in any body of water (Iannucci, 2012; Becker, 2009).

Aquatic therapy (AT) is defined as “a therapeutic procedure which attempts to improve function through the application of aquatic therapeutic exercises” (Salzman, 2007). Aquatic therapy is a therapeutic procedure; therefore, aquatic fitness or swimming does not qualify. Salzman also states that aquatic therapy should be done by “qualified personnel”, however, there is no conclusive way to determine who are qualified personnel in Canada as there is no specific training or certification individuals need to acquire to provide aquatic therapy. Aquatic therapy may be provided by individuals who complete various courses or training opportunities including: Kinesiologists, Athletic trainers, Physical Therapy assistants, Lifeguards and Aquafitness instructors.

¹ Suitably-heated hydrotherapy pool is 91-93 degrees Fahrenheit as per Iannucci (2012) and Becker (2009)

It is important to note that the terms “aquatic physical therapy (APT), aquatic physical therapists and aquatic PT” are protected which means only licensed and registered physical therapists can provide APT and advertise using the above terms. Neither ‘aquatic therapy (AT)’ nor ‘aquatic therapist’ are protected terms meaning anyone can provide these services, as there is no prerequisite, certification, education or training one must complete in order to call themselves aquatic therapists offering aquatic therapy. There is no legal scope of practice for aquatic therapists unless the individual is regulated under a separate college. For example, Registered Massage Therapists or Kinesiologists working in aquatic environments would function within their scope of practice. For this thesis, an aquatic therapist will refer to any individual with a rehabilitation or aquatic background who is not a registered physical therapist (PT).

Many aquatic-based programs exist under the common names of: ‘therapeutic aqua therapy’ ‘aqua fitness’ ‘water fitness’, and/or ‘water aerobics’. They are provided by a range of personnel, including graduates in Kinesiology; Occupational Therapy, a College degree in Athletic therapy, a personal trainer, an individual with their National Lifeguard Certification (NLS), or simply anyone over 18 having an interest in aquatic exercise, who takes a weekend training course at a private clinic. These services are not designed nor provided by a registered physical therapist (PT) as part of a treatment plan. Instead, the focus is on fitness and movement in water, whether at a municipal pool or in a private pool setting. Aqua-fitness and water aerobics are often taught by lifeguards or personal trainers, and consist of any exercise or movements done in the water for the purpose of fitness, well-being and/or strengthening. Aqua-fitness may be suitable for injury and/or disease recovery for some individuals; however, it is not part of a rehabilitation treatment plan, nor is it designed or delivered by a registered physical therapist.

How prevalent are services in aquatic physical therapy? Specifically in Ottawa, Ontario, an online search using terms “aquatic physical therapy”, “hydrotherapy”, “aquatic rehabilitation” and “aquatic therapy”, yielded nine (9) facilities that advertise APT services in the region. Several of these services are available at the local municipal pool, averaging 86-88 degrees Fahrenheit, which would not meet the required water temperature of 91-93 (Iannucci, 2012). There are also aqua-fitness classes directed at target populations. However these classes are run by aqua fit instructors and therefore were not considered aquatic physical therapy. A similar search completed on the same day using the terms “physical therapy” “land-based physical therapy” and “physiotherapy” yielded 233 clinics and physiotherapists in Ottawa. This was a basic internet search and therefore the clinics were not directly contacted. While this comparison does not take into consideration PT who do not advertise aquatic services, it does point to a difference in availability and presence of both modalities in Ottawa. There are significantly more LBPT than APT facilities regarding physical locations and therapists. This is supported through current research which states that APT is an underused modality but that it is becoming a growing trend (Brody & Geigle, 2009; Becker, 2009; Moerles, 2010). Not only are there a limited amount of facilities, but municipal pools can only allot certain times and space for AT and APT which need to match the therapists’ and patients’ schedule. This thesis looked to understand if these inhibiting factors influence the accessibility of AT and APT for certain populations.

Another potential factor that contributes to the limited use of AT and APT is that private insurance companies only cover APT if it is completed by a registered physical therapist. Physiotherapists do not need to specify the setting in which the therapy was performed (either land or pool) so the insurance claims are often covered. The problem occurs when individuals

provide AT, as most private insurance companies will not cover the claim. This demonstrates why it is crucial that the public is able to better understand the differences in treatment provided by a AT and APT, despite similar advertising messages.

Research questions

This study was guided by three main streams of research questions:

- 1) Who provides aquatic therapy and aquatic physical therapy? What education and training is provided within academic and private sectors?
- 2) How do practitioners build support for their practice and gain clientele? How does the field build cultural and social authority?
- 3) What are the facilitators/barriers for therapists working in the aquatic environment? Through the perspective of therapists, what are the facilitators/barriers for patient participation in aquatic environments?

Taken together, these questions guided the understanding of development and practice of APT in Canada. The above questions are open-ended, perspective based, insight driven questions. The researchers aimed to ask questions that answer ‘why’ and ‘how’. They looked to gain perspectives on the education system, values on building support and to explore facilitators/barriers. To do so, a qualitative approach was appropriate. Through semi-structured interviews and questionnaires, the data identified individuals’ current opinions regarding certification, accessibility, knowledge mobilization, barriers/facilitators as well as practitioner education. Research emphasized the benefits and potential recoveries available through aquatic therapy, yet it is still not common to find facilities that provide this service and overall AT and APT is underused (Brody & Geigle, 2009).

Thesis objectives

This research looked to provide an initial overall understanding of the current status of rehabilitative practices in aquatic settings in Canada. This research aimed to identify what knowledge and training practitioners need to acquire to practice in the aquatic environment. Who is practicing, what titles are they using, and what education/training do they require? Secondly, this research identified several facilitators and barriers that exist for practitioners and participants. By mapping out the current context, this research was able to provide recommendations and suggestions for the future development of rehabilitative practices in aquatic settings in Canada.

If the instructors, practitioners, educators and other influential individuals in the area of AT and APT are aware of the education, training and certification systems, it may influence the manner in which they monitor, hire and provide AT or APT. By identifying the ways in which the field builds support, practitioners could successfully implement new strategies to build their practice and reach larger populations. Lastly, if patients and practitioners are aware of the facilitators that encourage participation, they are more likely to implement and encourage patients based on these facilitators. Similarly, by identifying common barriers for AT or APT, practitioners may brainstorm ways to mitigate these barriers, and patients may be capable of recognizing techniques to eliminate certain barriers to enhance their participation.

This research strives to contribute to the discussion on the field of practice. At the moment, the scope of practice and treatments in aquatic therapy can lead to confusion on the qualifications of service providers as knowledge, training and education varies between aquatic physical therapists with a master's degree, and aquatic therapists with various backgrounds such as athletic therapists, aqua-fit instructors, Kinesiologists and lifeguards. This research focused on

exploring how ATs and APTs gain their knowledge and information. How is this knowledge within the field disseminated to future aquatic physical therapists and aquatic therapists? This research examined these questions by exploring opportunities for education and training on APT/AT.

The second aspect of the study looked at how APTs and ATs build support including through the regulatory college, other healthcare practitioners, referrals and successful patient testimonies. This research addressed how practitioners inform the public of their services, how patients learn about services and who provides support to practitioners. How does the field build support and medical authority? How does cultural and social authority exist within aquatic physical therapy and aquatic therapy? In particular, this study examined the process of creating social authority for aquatic physical therapy; informing and convincing the public of its cultural authority to understand the illness, and provide treatment. This research presents how insurance companies support AT or APT through the level of coverage allocated to their plan members.

Lastly, this research addresses current facilitators and barriers to practicing and participating in APT via the therapists' viewpoint. Therapists identified facilitators/barriers which influenced their decision to work within the aquatic environment as well as those the patients face when choosing to seek treatment in an aquatic setting. By identifying facilitators and barriers to seeking and participating in AT and APT, the research aims to provide needs-based suggestions to respond to issues around access and participation.

For the purpose of this study, data was collected on a Canada-wide scale, while briefly examining the status of APT in the United States as a comparative source. The parameters of this Master's research project included focusing on Ontario to further understand available training

and the regulatory policies which occur on a provincial basis. To gain therapists' perspectives and insight regarding private practice, data was collected specifically within Ottawa, Ontario.

Literature review

This literature review examined the history of therapeutic aquatic practices and reviewed current knowledge on the benefits, potential risks and interventions when practicing aquatic therapy. A literature search was conducted using six (6) health affiliated databases including SPORTDiscus, PubMed, Medline, JSTOR, Web of Science and ProQuest, between the years 2000 and 2017. Keywords included: "aquatic therapy", "aquatic physical therapy", "hydrotherapy", "water therapy", "pool therapy", "aquatics", "land-based physical therapy", "hydrogymnastics", "hydrotherapeutics", and "aqua-fitness". Retrieved articles were organized in order of relevance based on the research questions. Articles were selected based on titles, abstracts, year, English language, relevant populations and topics that related to the history, benefits, facilitators, barriers, risks, education, training, certification, and facilities. Informative, significant and relevant articles were selected for review and analysis.

I. History of therapeutic aquatic practices.

Hippocrates (460 – 370 BC) is considered the father of modern medicine. In his writings, Hippocrates advanced an understanding that water held significant healing powers (Bender, Balint, Balint, van Tubergen & van, 2002). He developed two terms to describe water as a method of rehabilitation: *balneotherapy* which meant any medicinal use of thermal water such as dripping, drinking or washing; and *hydrotherapy* which signified the complete immersion of one's body in thermal waters for therapeutic purposes (van Tubergen & van, 2002).

Thermal baths proliferated throughout Ancient Greece and the expansive Roman Empire. There were over 800 public thermal baths built by the third century AD. This brought to thousands the practice of bathing and relaxing muscles in a series of immersions in warm and cold water followed by sauna and massage (Foley, 2010; Ring, 1996; Becker 2009). Due to Roman engineering and the ability to construct aqueducts, these public baths were large-scale bathing complexes (Foley, 2010). After the fall of the Roman Empire (476 C.E.), people abstained from bathing for long periods of time, sometimes for years, as it was prohibited and the public baths were removed and transformed into churches. During the Middle Ages, bathing was also discouraged as it was viewed as an environment in which contagious disease such as the plague or leprosy could easily spread (van Tubergen & van, 2002; Cole & Becker, 2004). Yet, by the 16th century Renaissance Period, several Italian doctors re-assessed earlier Greek and Roman writings on the benefits of therapeutic waters, and encouraged the use of bathing for medicinal purpose. They identified 78 conditions that could benefit from the use of warm water, and often combined treatment with other prescriptions such as drinking cures and the application of mud. By the 17th century, bathing was viewed for the purpose of treatment, with provisions to rinse off before entering the baths (van Tubergen & van, 2002). Many other cultural groups strongly believed in the beneficial healing properties of water, including multiple Slavic cultures in Eastern Europe (Cole & Becker, 2004). Much like their Roman predecessors, health practitioners in China promoted the ways in which water absorbs and radiates heat, and thus used warm springs for the sick and suffering to find relief (Fields, 1950). The Indian populations were known to use water as a method for curing fevers; Egyptian and Indian civilizations used soaking waters for the sick as a source of relaxation and cleansing; and North American Indigenous

populations used natural mineral water springs for healing practices (Irion, 1997; Burns & Burns, 1997; Vierville, 2004; Cole & Becker, 2004).

In the early 20th century, the physical properties of water were identified and utilized for the purpose of active “hydrogymnastics” which involved intentional exercise in water. Hydrogymnastics is the oldest derivative form of APT and was the first implementation of therapeutic exercise underwater versus prior passive water-based treatments (Brody & Geigle, 2009). In 1924, Charles Lowman developed a treatment tank for hydrogymnastics in Chicago for patients suffering from paralysis. In 1928, the first Hubbard tank was developed which was a warm water tank that initiated the development of pool based physical therapy programs in a contained warm-water setting (Becker & Cole, 2005).



Figure 1. Physical therapist assisting patient in an original Hubbard Tank.

Digital Forsyth (1948). Hubbard Tank Whirlpool Therapy. Wake Forest University, North Carolina.

<https://www.digitalforsyth.org/photos/2098>

The successful results from rehabilitation in these tanks increased the popularity of water as a rehabilitation setting, and orthopaedic surgeons began recommending its use. In 1921, the

American Physical Therapy Association was founded and physical therapy degrees were offered in some American universities. Research was ongoing on the potential of physical therapy in warm water settings. By the mid 1980's the field of APT was widely-recognized for its benefits in injury recovery, and for those who could not participate in high-impact land exercise. Many professional organizations were developed in the 1990s in response to the growing formal recognition of evidence on the benefits of aquatic therapy. Although the APTA was founded in 1921, the Aquatic Physical Therapy Section did not become a registered subsection until 1992 (APTA, 2016). The successful development of a subsection for APT within the American Physical Therapy Association (APTA) protects therapists and patients by enforcing a standard of care for those in rehabilitation. AT does not have an outlined history as such since the field is broad and ambiguous, and there is no definitive date for its commencement or modernization.

The Aquatic Therapy Rehab Institute (ATRI) is located in Florida, USA and is an educational organization that aids in professional development for healthcare practitioners involved in aquatic therapy (ATRI, 2017). In 2004, ATRI developed the Aquatic Therapy and Rehabilitation Standards for the Industry within the United States. These standards provided an analysis of the practice which outlines the knowledge and abilities necessary for a physical therapist to specialize in the aquatic environment. ATRI examined the best practices in the field to date and developed a list of core competencies and training for physical therapists offering physical therapy in an aquatic setting. These include: knowledge of methods, principles, movement mechanics, contraindications, health and safety certifications and regulations/legal considerations (Aquatic Therapy and Rehab Institute, 2004). There are requirements and specific regulations in certain states, but no national policy regarding formal training (Brody & Geigle, 2009).

In Canada, the history of aquatic physical therapy is less known. However, excellent studies on the history of physiotherapy in Canada allow us to situate the broader field of rehabilitation to the post WWI period. After the First World War ended in 1918, more than 70,000 soldiers returned home with serious disabilities and injuries (Heap, 1995). Throughout the 1920's, the federal government funded and supported rehabilitation programs which endeavoured to return soldiers to prior physical abilities, thus providing rationale for the development of physiotherapy in Canada. In 1920, the Canadian Physiotherapy Association was founded. Historian Ruby Heap (1995), argues that this was the first effort to professionalize physiotherapy and rehabilitation in Canada. It is more challenging to pinpoint an exact year in which the aquatic physical therapy was recognized as a form of rehabilitation, as Canada does not have a distinct subsection or designation for APT within the CPA.

II. Overall benefits.

The following review will discuss the contemporary literature on the current implementation of AT and APT, its benefits and what distinguishes aquatic-based rehabilitation from land-based therapy. Historically, the first description of Aristotle urging immersion and therapy in warm sea water still resonates today. Research evidence informs us that best practices in AT and APT occur in warm water pools heated to 91-93 degrees Fahrenheit (Becker, 2009). At this temperature, one can successfully implement therapeutic methods as a way to improve strength, flexibility and cardiovascular functioning without the weight bearing and joint compressing aspects of land-based exercise (Becker, 2009; Wolski, 2007; Volpe, et al 2014). While swimming is generally considered a good way to recover from injury, specific aquatic therapy performed in water is beneficial for treating several acute and chronic conditions, in addition to basic injury recovery (Prins, 2010).

In comparison to land-based physical therapy (LBPT), AT and APT have the potential to provide alternative rehabilitation outcomes for specific populations, such as osteoarthritic individuals, post-surgery patients or those suffering from Parkinson's disease (Volpe, Giantin, Maestri & Frazzitta, 2014; Hinman, Heywood & Day, 2007; Vivas, Arias, Cudeiro 2011). On a cellular level, AT improves range of motion, increases muscle strength, and improves balance while decreasing pain and stiffness (Wolski, 2007; Volpe, et al 2014; Leslie, 2006; Prins, 2010, Wilk & Joyner, 2014). The key elements that distinguish aquatic physical therapy (APT) from land-based physical therapy (LBPT) are the physical properties of water, including buoyancy and viscosity. Buoyancy reduces the gravitational force on the human body and decreases one's weight and the pressure placed on skeletal system (Leslie, 2006). By reducing the load placed upon the lower limbs, the participant's joints are able to relax and produce larger movements in different planes than they are capable of performing on land (Leslie, 2006). Another benefit of water is that by varying the degrees of immersion, the effect of gravity can be slowly and strategically re-introduced which can allow for gradual strengthening (Leslie, 2006). Underwater viscosity applies resistance to the moving body and this resistance matches the force that the participant applies (Prins, 2010). The possibility of the participant exceeding their individual injury tolerance is exceptionally diminished in this environment (Prins, 2010). Activities completed during AT and APT can vary from floating exercises, different submersion techniques, swimming exercises and even games that can challenge the patient's physical abilities (Martel, Tetreault & Denis, 2010). The health benefits of exercise performed in water have been shown to be equal or surpass that of walking or running with the added benefit that the aquatic environment can accommodate specific populations (Becker, 2009; Wilk & Joyner, 2014).

Apart from the physical properties of water, the ability to manipulate water temperature is another beneficial characteristic of AT and APT. Warm water increases blood flow throughout the body and by doing so, muscles are capable of relaxing, movement is facilitated and edema is reduced (Leslie, 2006). Patients working to improve weight bearing joint conditions such as osteoarthritis may benefit from AT and APT as the buoyancy of water allows for decreased pressure on the joints. One is able to reintroduce weight bearing gradually by decreasing the submersion level as the weight bearing joints will acquire more body weight when the individual is submerged in waist-level water versus cervical-level water. Aquatic physical therapy may provide an environment for exercise and treatment that is safer and more comfortable for those who are experiencing pain, or are not capable of doing land-based physical therapy. Examples of this include those suffering from Parkinson's – concerns about losing balance on land, those suffering from multiple sclerosis – incapable of completing a full walking gait on land, or those who suffer from fibromyalgia or osteoarthritis – pain occurs during traditional land based forms of exercise (Volpe, Get al, 2014; Leslie, 2006; Prins, 2010; Lima, et al2013).

III. Techniques of aquatic physical therapy.

Land-based physical therapy techniques and skills require the use of a bed or exercise mat to complete. PTs who do not work in the aquatic setting must adapt their rehab programs to the new environment while remaining mindful of the new risks inherent of the aquatic setting. APT techniques and methods are very different from that of LBPT as they are unique to the aquatic environment. Manual stretching is often completed in waist-depth water with the use of buoyancy equipment to raise the waist, neck and feet. In comparison to land-based therapy, this supine supported position improves the practitioner's ability to stretch, manipulate, control and

access the patient (Kisner, Colby & Borstad, 2017). Some of the most common aquatic approaches include watsu, bad ragaz ring method, Halliwick concept or burdenko method. For example, the bad ragaz method is consists of models focusing on legs, trunk or arms and can be completed unilaterally or bilaterally. This method is done with the patient floating on their back and is initiated by the therapist, for example, changing the center line of gravity by rolling the body. The patient must then use counter-force to prevent the body from rolling in a reactive manner (Stan, 2017). Watsu method is a form of passive stretching with focus on deep breathing to encourage relaxation for the patient promoting physical relief. This method is often implemented for patients with chronic pain such as fibromyalgia (Leite, Alves, Silva, Do Prado, Do Prado & De Carvalho, 2013)

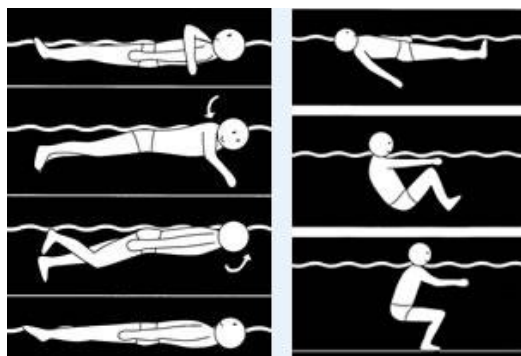


Figure 2. Halliwick pictogram of basic movement.

Aquatic Rehabilitation Consultants. (2014) Retrieved from: <http://www.halliwick.net/en/news>

It is important to note that the water environment poses potential risks such as drowning, swallowing water, reactions to chlorine, the increased risk of falls entering and exiting the pool, and within the change rooms (Public Health Agency, 2011) Therefore, these aquatic methods and techniques may require a learning and adjustment period for the practitioner.

IV. Targeted interventions.

There has been a significant amount of North-American research on water-based rehabilitative practices including the works of Brody & Geigle (2009), Bruce Becker (2009), and Wilk & Joyner (2014) who published their research-based practices and techniques for aquatic physical therapy and aquatic therapy, tailored to multiple target populations.

An intervention-based study on patients suffering from knee and hip osteoarthritis consisted of a six (6) week APT program for 71 participants. The results confirmed patients experienced less pain, less joint stiffness, greater strength and greater physical function. The study found that 75% of participants in the APT intervention reported these improvements while 17% of a control group (no intervention) reported improvement (Hinman, Heywood & Day 2007). In 2011, Vivas, Arias & Cudeiro compared and assessed LBPT and APT for people with Parkinson's. Eleven (11) participants with stage 2 or 3 Parkinson's completed 4 weeks of APT or LBPT, partaking in 45 minute sessions twice a week. Both groups performed better on a balance with reach test (functional reach test) after treatment; however, only the APT group improved on the balance test (Berg Balance scale) and the Unified Parkinson's Disease Rating Scale. Postural stability for people with Parkinson's performing APT was significantly higher than those who completed LBPT.

Yet, other studies found similar or no differences between the two intervention groups (LBPT and APT). Villata and Peiris (2013) completed a meta-analysis comparing LBPT and APT for lower-limb surgery rehabilitation in which they concluded both protocols are equally effective during the postoperative period. Park, Noh, Kim, Lee, Yang, Lee, Shin, Kim, Kwak, Lee, Park, Kim, (2016) compared the effects of APT and LBPT on gait performance for stroke patients in which the data confirmed both groups had significant improvement in gait

performance ability after post-stroke. Lastly, Palamara, G., Gotti, F., Maestri, R., Bera, R., Gargantini, R, Bossio, F., Zivi, I., Volpe, D., Ferrazzoli, D., Frazzitta, G. (2017) assessed improvements for patients with Parkinson's completing LBPT-only versus LBPT and APT combined. Results demonstrated further improvement for groups performing both APT and LBPT and concluded that APT added to LBPT treatment could provide improvement for balance dysfunction in patients with Parkinson's. In summary, current research demonstrates the benefits of aquatic rehabilitation as an important healthcare service for general and targeted populations (Volpe, et al, 2014; Leslie, 2006; Prins, 2010).

V. Facilitators and barriers.

Multiple barriers for APT have been demonstrated in current literature including underreported safety precautions, underreporting of feasibility, lack of evidence demonstrating the effectiveness of APT instead of LBPT and lack of adherence or attendance (Terrens, Soh & Morgan, 2017; Brady, Redfern, Macdougall & Williams (2008). Terrens et al. (2017) completed a systematic review on feasibility and efficacy of APT for patients with Parkinson's which described most intervention-based studies do not provide safety information such as pool depth, temperature, intensity, number of staff present, safety precautions during treatment, level of training of therapists, fall history, and other environmental factors such as wet floors. These may all act as barriers for patients who are not currently participating in APT.

Facilitators of APT consist of confidence in one's ability to perform the movements as well as assurance that the exercises were of value to aid with the patients' recovery (Brady et al., 2008). It has been demonstrated in the literature that patients are more likely to adhere to an APT program when the duration and intensity are tolerable. A study by McIlroy, Sayliss, Browning &

Bearne (2017) suggested 30 minute sessions once a week for six (6) weeks was sufficient to produce small-to-medium effects in clinical outcomes while ensuring patients continue participation and maintain attendance.

Research examining the barriers and facilitators of APT is limited, however, additional studies have identified barriers and facilitators for LBPT. Research examining patient-perceived barriers to participation in land-based physical therapy has provided therapists and patients with an assortment of barriers that may limit participation. In a study completed by Leiter, Wilkinson & Verceles (2015), the researchers were able to identify potential barriers that did not influence their patients' decisions to participate including: mood and energy levels, family support or effectiveness of therapy. The research concluded that other unidentified barriers limit participation in PT. A second study which looked at the barriers to participation and adherence to cardiac rehabilitation programs identified multiple factors such as lacking physician referrals, reimbursement, self-efficacy, distance, transportation, self-motivation, and occupation (Daly & Sindone, 2002). Although this research does not specifically address the barriers to APT, there is potential that some of the land-based PT barriers would overlap over and exist as barriers for patients of APT as well.

In sum, this literature review provides support for the research questions addressed in this thesis. The physiological benefits of APT have been established and identified while therapeutic interventions have determined the most suitable populations for APT. However, little is known about the best practices, training, safety guidelines, and facilitators/barriers from both the practitioners' perspective and their perception of patients' perspective. This study will contribute to this body of literature on APT and AT in Canada.

Theoretical framework

This thesis adopted the theoretical framework of medical authority developed by Paul Starr (2004). In his work, “The Social Transformation of American Medicine” (1982), Starr contextualizes the development of health care from primarily in-home services in the 18th century, to a professionalized and institutionalized system by the early 20th century with focus on disease prevention, treatment and building a revenue-generating sustainable model. Starr theorizes that North American physicians attain medical authority that is constructed and disseminated in two ways – cultural and social authority. Cultural authority invokes the power to conceptualize and define health, illness and healing; and social authority encourages the public to accept their advice.

Culture reflects meaning and ideas within a society. In this theory on medical authority, it is understood that healthcare providers possess varying cultural understandings, meanings and ideas of illness, healing and judgements regarding health. Cultural authority thus refers to the form of authority embedded in healthcare provider’s judgements, thoughts, and values on health. Through the process of professionalization and formalizing knowledge and expertise, this cultural authority is consolidated, questioned and renegotiated.

Social authority refers to how the public is informed and convinced of medical cultural authority. It is a form of authority that encourages the public to accept medical beliefs and ideas and to subsequently act. Yet, a patient holds a degree of agency and can resist and/or renegotiate the mobilization of cultural authority. Therefore, social and cultural authorities are not guaranteed to occur simultaneously. Cultural authority can exist without any action from the patient; it pertains to circulation of ideas, thoughts and beliefs among healthcare providers. In order for social authority to exist, one must respond with an action (Starr, 1982).

Throughout this thesis, the researchers looked to understand the power dynamics in the field of rehabilitation and explore the place of ATs/APTs and the development of cultural and social authority. This theoretical framework was adopted to examine how cultural authority on APT is constructed and by whom. The process of creating social authority on APT is achieved through informing and convincing the public of the benefits of its use. In a broader sense then, this thesis looked to theorize the development of knowledge and practice of aquatic physical therapy through the lens of constructing cultural and medical authority on APT in Canada. This framework allowed the researchers to critically examine the development of education, training and regulation of practitioners, and situate issues that shape the practice and APT services today.

Methodology

This study sought to investigate the knowledge of stakeholders in the field of aquatic physical therapy by adopting an interpretivist perspective. Interpretive viewpoints emerged as a response to previous positivistic ideologies which placed a focus on relativist ontology; with interpretive viewpoints, reality is assumed to be socially constructed and therefore poses different meanings for all subjects (Pascale, 2011). The nature of knowing is deeply rooted in the past and each individual's social world influences their beliefs.

Since this study is framed through an interpretivist perspective, the researchers were aware that data collection and results are shaped within particular contexts and environments. As the methods include semi-structured interviews, it is recognized that the participants' responses provided during questioning, and the ways in which the researchers code for meaning, was dependent on that particular moment in time. However, that does not lessen the importance and influence of the research being conducted. In fact, it increases the significance as it

acknowledges that context, personal influence and participant bias from lived experiences are represented in the current context. The researchers looked to understand reasoning underlying participants' responses. As such, the researchers sought to situate their responses and points of view within a broader context.

In order to apply this epistemology and theory to gain knowledge and understand the field of AT and APT, qualitative methodology was implemented. Qualitative methodology provided personal perspectives of those interviewed and questioned which allowed respondents to speak to their experiences, attitudes and thoughts. These perspectives provided great insight into how AT and APT are practiced in Canada through a unique and individualized viewpoint. Qualitative methodology was adopted for its exploratory nature of the research questions. Little is known about the field of rehabilitative practices in aquatic settings in Canada. The qualitative research design aided to flesh out the participants' thoughts and understandings of AT and APT. This methodology provided a comprehensive understanding of AT and APT by encouraging interviewees to thoroughly explain their responses and provide reasoning (Grbich, 2013).

Methods

Semi-structured qualitative interviews allowed the researchers to explore the field in a manner that is specific to this one location, demographic, time and environment. Interviews were conducted with aquatic physical therapists, aquatic therapists, instructors on aquatic therapy and members of the College of Physiotherapy and association. Interviews were combined with open-ended questionnaires sent to Chairs of Physiotherapy programs in fifteen (15) Canadian Universities. This included Dalhousie University (Nova Scotia), Université Laval (Quebec), Université de Montreal (Quebec), Université du Quebec a Chicoutimi (Quebec), Université de

Sherbrooke (Quebec), McGill University (Quebec), McMaster University (Ontario), Queen's University (Ontario), University of Ottawa (Ontario), University of Toronto (Ontario), Western University (Ontario), University of Manitoba (Manitoba), University of Saskatchewan (Saskatchewan), University of Alberta (Alberta) and University of British Columbia (British Columbia). Contact names were identified from respective university websites. This method allowed us to gain insight into teaching and education of APT, and provide information on the quantity and structure of APT material included in university curriculums in Canada.

An application to the Research Ethics Board was submitted to conduct semi-structured interviews, and to send out questionnaires to Chairs of Physiotherapy programs in Canada. This project received approval for ethics from the University of Ottawa Research Ethics Board, and participation recruitment was initiated thereafter. (Appendix D).

Interview participant sampling

Selection of participants was based on purposive sampling with the potential for snowball sampling to be implemented if the opportunity arose. Stakeholders were contacted across Ontario and specifically within Ottawa. Stakeholders were defined as anyone who has knowledge, expertise or experience in the area of AT and APT. The researchers completed an extensive online search to identify available courses and training programs open to individuals in Ontario who wish to work within AT and APT. The managers or facilitators of the five (5) most reoccurring training courses available to Ontarians (Including PTs) were purposefully contacted. A member from both the College of Physiotherapy of Ontario (CPO) and the Canadian Physiotherapy Association (CPA) were intentionally sought out along with all owners of APT-specific facilities in Ottawa. Lastly, the Canadian representative for APT in Canada was

purposefully contacted as they work through the World Confederation for Physical Therapy (WCPT) based out of the UK which strives to collaborate on an international level, maintain high standards of practice within PT and support the sharing of information between members and organizations. The Canadian representative, based within Ontario was able to initiate snowball sampling as they provided the researchers with another stakeholder within Ontario as well as an instructor and practitioner from the United States which allowed for a national understanding within North America.

Each potential interviewee was contacted by the primary researcher who provided them with an explanation of the study, its purpose and the reason for their requested participation. Further information was available upon request and individual interviews were based on the participant's availability. The data content was flexible throughout the collection period as prior interviews influenced future interview direction.

The target was to include six to eight (6-8) semi-structured interviews of AT and APT stakeholders in Ontario. This quantity of interviews was considered sufficient by the researchers once a representative from each category (instructors, practitioners, and organizational members) was interviewed. Researchers ensured that more than one voice from each category was represented thereby providing more than one perspective.

Interviews were conducted in English or French, in a mutually agreed safe location, either in a separate office at the pool or physiotherapy clinic. Interviews were also conducted over the phone. The researchers aimed to interview registered physiotherapists working in the aquatic environment, non-physiotherapists working in the aquatic environment, instructors providing courses on AT or APT in Canada, instructors providing courses on APT in the United States, the College of Physiotherapy of Ontario and the Canadian Physiotherapy Association.

The participation with a CPA member consisted of an e-mail communication and no interview was conducted. Data collection with the CPA and CPO was conducted to understand APT and its legislation, regulation, licensing, insurance and education requirements as well as an overview on how the field gained recognition in rehabilitation. Interviews with the practitioners provided further understanding of the progression of AT and APT, the barriers to participation, how patients are learning about AT and APT and public uptake. It also allowed the researchers to understand any challenges with physical therapy differentiation compared with other available aquatic courses and what training the practitioners possess. Two practitioners who are owners for APT facilities within Ottawa, Ontario were also interviewed. These two private clinics are the largest APT locations in Ottawa. The interviews with instructors in the field allowed for further insight regarding how aquatic therapists are educated, trained, and the type of services they provide.

By conducting interviews with these stakeholders in the field of AT and APT, the purpose was to analyze several themes related to education, knowledge mobilization and management. The interviews were semi-structured in that the researcher had an interview guide; however, as important topics came up, the researcher could adapt from the pre-set questions and pursue additional questions. The general content of the interview questions focused on a number of themes including: how AT and APT is practiced in Canada, training, public uptake, patient education, how patients learned about rehabilitation options, satisfaction, barriers to AT and APT for patients, barriers to AT and APT for practitioners, risks for patients, and overall understanding of aquatic therapy in Ontario. The interview guide is attached (Appendix C). One main interview guide was utilized; however the guide had sections which focused more heavily on different research questions and focal points, depending on the scope of practice of the

interviewee. Specific questions were tailored to the individual respondent in that interviewees from the CPO answered questions concentrated on policy and legislation. Questions regarding instruction courses were prioritized for respondents who provide training courses. The interview guide was malleable in that certain topics were emphasized for certain respondents and questions were specified to interviewees experience and areas of expertise.

The primary researcher's previous and current experience as a healthcare practitioner in the field of rehabilitation needs to be addressed as a potential bias. The primary researcher is a registered Kinesiologist and has worked in the clinical setting for land based physical rehabilitation for the past four years, although has fairly limited knowledge on APT. The primary researcher believes prior experience is an advantage as she possessed knowledge of context, terms and information utilized by interviewees. She was able to interact on a level of understanding that without experience in a clinical setting, may have been challenging. To limit research bias, interviews were audiotaped and transcribed verbatim which ensured the researcher's memory or input was not influencing the data. The primary researcher also conducted a mock-interview to help identify prior assumptions and biases that may have been exhibited through interviewing.

The interviews were audiotaped, transcribed, and transcriptions are stored within a locked office at the University of Ottawa. Audio-taping the interviews allowed the researchers to replay the recording as many times as necessary in order to ensure accuracy in verbatim transcription, which limits researcher bias. A member checking process was completed after the interviews. The transcripts were e-mailed to participants to allow them to read the transcriptions of the interview. Participants had the opportunity to make revisions and send back to the researchers.

Questionnaire participant sampling

In Canada, the graduate program in Physical Therapy is offered in fifteen (15) university programs within seven (7) provinces. Short answer questions were sent to the fifteen (15) department heads of Canadian graduate programs in Physical Therapy. These individuals were identified through the universities' public website. An introductory email was sent to each department head, containing information about the study, ethics, consent form, and the 5 short answer questions. Of the fifteen (15) questionnaire requests sent to Canadian universities, five (5) were returned within two weeks. Additional questionnaires were returned after a follow-up e-mail. In total, seven (7) completed questionnaires out of a possible fifteen (15) were submitted. On three additional occasions, follow-up e-mails were sent in English and in French, and the data collection period was extended by two months. This did not yield additional responses. Thus, we received completed questionnaires from seven (7) universities within six (6) Canadian provinces. From the responses received across Canada, several program characteristics including time spent on APT, theoretical/practical division and placement opportunities, were similar.

Data responses

During Spring/Summer of 2017, ten (10) interview requests were sent to key stakeholders in the field of Aquatic Therapy in Ontario, Canada. They were considered key stakeholders based on their knowledge, expertise or experience in the field. Participants were identified through an environmental scan for individuals who were connected to the largest and most established associations and organizations for AT and APT within Ontario and the founders of APT-specific facilities in Ottawa. Eight of the ten participants were contacted through purposive sampling and two interviewees were contacted based on snowball sampling when previous

interviewees suggested their participation. Two interviewees hold positions within organizations related to physical therapy; two interviewees own the two most-advertised APT facilities in Ottawa; one interviewee is the Canadian representative of APT internationally; and four are aquatic therapists or aquatic physical therapists that either provide treatment or instruct others to become aquatic physical therapists and aquatic therapists.

During the data collection period, seven (7) individuals were recruited to complete an interview in-person or over-the-phone. One additional participant shared information through an e-mail conversation. The interviews had an average duration of 41 minutes. The goal of the interviews was to gain insight from a range of key stakeholders in the field, and not to reach ‘saturation’. The objective of such exploratory research is to start situating AT and APT within the overall rehabilitation discipline. Utilizing a qualitative methodology produces insight into multiple perspectives of the current status. Therefore, the following results are only representative within the specific time, location and perspectives provided. These results are not generalizable across Canada, Ontario or even Ottawa. Since the goal was not to attain generalizable results, the data collection period was not based on saturation. Instead, the data collection period was deemed complete once a minimum of two perspectives from each category were obtained.

Two interviews were conducted in person with the Chief Executive Officers of the private APT facilities in Ottawa. The other five (5) interviews were conducted over-the-phone when both the participant and the interviewer were in a private space. Two interviews were conducted while the participants’ children under five (5) years-old were present. This posed a slight distraction at times but did not seem to influence the participants’ responses or ability to participate. All interviews were conducted in July and August of 2017.

Participant profiles

The profile of the interview respondents is summarized in Table 2. Their characteristics, employment position, education and background are presented below. All of the participants provided verbal and written consent to be identified in this thesis, and subsequent knowledge dissemination (Appendix A).

Table 2

Interview Participant Information

Interviewee #	Gender	Current Position	Education
1	F	Registered Physiotherapist, founder of APT instructors course	Masters in Rehabilitation Science, Bachelor of Physical Therapy, numerous courses through the aquatic therapy university in the USA
2	F	Registered Physiotherapist, WaterART teacher, has worked in USA	Doctorate of Physiotherapy, many courses through WaterART
3	F	Works in USA as a Registered Physiotherapist	Doctorate of Physiotherapy, shadowed therapist in aquatics
4	M	Associate Registrar of policy and quality at the College of Physiotherapy of Ontario	N/A
5	F	Aquatic therapist, instructor for ATRI, past instructor for CALA	Masters of Science and Exercise Physiology, Bachelor of Education, Bachelor of Human Kinetics
6	F	Founder/CEO of APT facility	Masters in Physical Education, various aquatic courses

7	F	Registered Physiotherapist, CEO of APT facility	Masters of Science in Physiotherapy, CARI courses
8 (non-interviewee)	F	CPA member	E-mail exchange

Data analysis

Once the interviews and questionnaires were conducted, data analysis consisted of a thematic analysis to allow for understanding and interpretation of key themes that emerged. The interviews were transcribed verbatim with the use of a recording device and it was replayed on average three times to assure exact wording was captured. Once the transcription was complete, the recording was verified and checked with the written transcription to ensure accuracy. A member checking process was then performed by e-mailing to all participants their individual transcript. This encouraged participants to read the transcription of the interview in which they participated. Participants had the opportunity to make revisions and add or remove content. Three participants responded; one suggested grammatical revisions, one expanded on her ideas and one confirmed accuracy.

Thematic analysis is a qualitative data analysis technique that allowed for coding of major themes (Braun & Clarke, 2006). The themes that appeared in the data sets were used to describe the phenomena of rehabilitative practices in aquatic settings. The primary researcher became familiar with the data by rereading the transcriptions repeatedly. Discourse surrounding the certification, education, support, barriers, facilitators and future recommendations were highlighted. All interview transcripts were analyzed together despite being conducted with practitioners, instructors and college/association members. It was advantageous to analyze the transcriptions as one set of data since they were all conducted using the same interview guide and similar topics, thoughts, ideas and directions arose during interviews.

A keyword coding was completed to identify the most common and influential words that were introduced through the interviews. Manual highlighting in various colours was utilized to create initial codes and concepts that appear in the data set repetitively. A table was then created that provided headings of potential themes, and quotes were inserted under these columns as appropriate and new columns were created for codes that emerge with further analysis (Grbich, 2013). Once the data was inserted for the larger themes, subthemes were identified within the themes which were then colour coordinated. As suggested by Uzzell, D, Vasileiou, K, Marcu, A, & Barnett, J (2012) the thesis supervisor separately coded every individual transcript to compare and select reoccurring themes which limited researcher bias, as suggested by. If discrepancies arose, both researchers reviewed the original transcripts and reached agreement on which theme and code were best suited. Most commonly, there were discrepancies regarding the headings of titles for the themes. For this, both researchers reread all the codes and subthemes in a grouping column and subsequently agreed upon an all-encompassing theme heading. Guided by the research questions, codes were developed while themes and subthemes were identified. After inserting quotes and concepts under a generic heading, each data section was re-read and given a theme name that represented all of the concepts in that specific column. These themes were verified by the thesis supervisor, and shaped the structure of the results discussion. Interviewee citations were drawn directly from each column to support the conclusions.

Thesis outline

This thesis is divided into four chapters. The introductory chapter outlined the background, research questions, thesis objectives, literature review, theoretical and methodological frameworks. Chapter two focuses on education, training and certification of AT

and APT in Canada. Chapter three focuses on the practice of AT and APT in Ontario, including discussion on building support and the facilitators/barriers to participation. Chapter four includes a discussion on training, and proposed a three-tiered course system for practitioners. This chapter also includes the conclusion, future recommendations, study limitations and future research directions.

CHAPTER 2: ACQUIRING KNOWLEDGE AND TRAINING TO BECOME AN AQUATIC THERAPIST AND/OR AQUATIC PHYSICAL THERAPIST

This chapter will focus on becoming an Aquatic Physical Therapists and/or an Aquatic Therapist. This research provides insight into education and training of APT/AT in Canada. The two themes that emerged from this study were: 1) the process of acquiring knowledge – University curriculum, private training, and/or on-site employee training 2) Certification.

I. Acquiring knowledge

Physical Therapists choosing to practice in an aquatic environment have gained knowledge through multiple educational modalities. They first become professionals through a graduate program of Physical Therapy, and successfully completing a national exam. Within Canadian university graduate programs in PT, they are exposed to information regarding APT. While not obligated to complete any additional training to provide APT, there are post-graduation options.

University education. Of the University programs who responded to the questionnaire, most students completing their Masters of Physical Therapy in Canada receive APT training. This varied across Canada, as some had the opportunity to choose a placement in a setting that offered APT, while others received compulsory theoretical and/or practical application within the course curriculum. The research questionnaires were completed by the departmental heads of universities across Canada and they provided insight into current curriculum, revealing that students were most commonly provided with two hours of in-class theory, and in some cases,

supplemented with practical application in a pool. It is interesting to note that one university provided their students with a two-hour in-class theory session as well as a two-hour in-pool practical session, while another university combined theory and practical in a one-hour session. Several university respondents discussed opportunities for practical implementations through chosen placements that students complete throughout the two-year program. For example, three of the seven universities who completed the questionnaire provided mandatory in-water practical lab whereby students practiced the hands-on techniques of APT. Some students had the opportunity to have a clinical placement in a rehabilitation hospital, or a community center that has an aquatic physical therapy warm water pool on site.

The universities not offering their students this experience discussed a lack of available facilities, cost of pool maintenance and/or challenges regarding feasibility for large class sizes. For one university, space and number of students created challenges as one respondent explained ‘It has been really tough to offer a practical session to all of our students’ (Questionnaire Respondent 1). When asked about their students’ level of preparation and ability to work within the aquatic setting upon graduation, the majority of respondents replied that students acquire a basic level of competence but further training, mentorships and emergency preparation could be beneficial. However, there was some contradictory data as one respondent indicated ‘[they] would likely need additional training’ while another stated that their students would be fully competent.

The data from the questionnaires corroborated findings from the interviews that additional education within the Physical Therapy program, specifically practical application, could be beneficial for graduates practicing in the aquatic setting. One interviewee described how education of aquatic physical therapy could improve: ‘I see [it] improving by ensuring that

it's in each and every physical therapist school. There should be some mandate for a number of hours' (Interviewee 1). She discussed how the first level of education needs to be within the University program itself, before students become Registered Physiotherapists. Afterwards, therapists could seek out additional training, should they choose. A practitioner stated, 'I'd love to see more of it in school' while another interviewee discussed her personal experience in school in a Canadian University 'I think we may have spent some of a course saying "here's water, here are the water properties, here's what it can change...." literally I think it was probably a 20-minute talk' (Interviewee 7). Some interviewees discussed their experience acquiring knowledge within American Universities. In some programs in the United States they received a full day of theoretical lectures and a half or full day of practicum. One interviewee described how universities in some States developed their programs to allow students the opportunity for specialization: 'Some Schools have done like a residency, I think of it more as a fellowship in Med School, where you do your Med School training, you do your rotations or residency' (Interviewee 3). Interviewee 6, who owns and operates an aquatic facility stated how she and her team would like to provide specific curricula on APT at the University of Ottawa. Specifically, she could lecture on evidence-based practices in APT and provide practicum at her private facility. One respondent in academia discussed the concern that some physical therapy professors may not be familiar with current research in the area of APT, and therefore this lack of knowledge may limit the extent to which APT is incorporated into the curriculum. Overall, interviewees agreed the best place for students to become knowledgeable and competent in APT was through their university program in Physical Therapy.

Private training. There are multiple options for individuals to acquire knowledge through privately-organized training courses. Several interview participants are instructors or

founders of these training courses including Canadian Aquatic Rehab Institute (CARI), waterART (2017), Canadian Aquafitness Leaders Alliance (CALA) (2017), and Aquatic Therapy and Rehab Institute (ATRI). These courses are often taught by health professionals who have specialized knowledge in AT or APT but there is no mandatory level of knowledge or regulation regarding who can provide these courses nor is there any regulation surrounding the material taught. Participants of these private training courses vary drastically as anyone can register including Physiotherapists, Physiotherapy Assistants, Chiropractors, Kinesiologists, Massage Therapists, Occupational Therapists, Occupational Therapy Assistants or Athletic Therapists. Material taught in these courses is generic aquatic therapy and physiotherapists along with other allied health professionals can use the techniques and information to adapt their own practice. Upon completing such courses, physiotherapists are entitled to use the term aquatic physical therapists just as occupational therapists could use the term aquatic occupational therapist. Interviewee #1 developed the Canadian Aquatic Rehab Instructors (CARI) association and explained how the goal was to provide aquatic therapy training across Canada. Anyone can register in CARI certification programs, but most of their clients include members within the rehabilitation or aquatic domains. Courses cover an array of divisions from basic to advanced training on topics such as neurology, orthopaedics, and multiple water specific techniques for rehabilitation. The duration of these courses can vary from one to three days depending on the level and content. Courses are available across Canada, however, most are delivered in Ontario. Other private organizations that offer courses on aquatic training programs include, but are not limited to, Aquatic Therapy and Rehab Institute (ATRI) in North America, Aquatic Therapy University (ATU) in the United States and Canadian Aquafitness Leaders Alliance (CALA) in Toronto. There is no specific recognition of one course or training program over another.

However, they all have an individual certification procedure which may include written and/or practical exams, allowing participants in Canada to proclaim they have advanced training in the aquatic environment. To date, there is no designation or overarching term ascribed to individuals with this form of training.

As stated by three of the interview participants, the attendees in these courses can be aqua fit instructors, rehabilitation professionals, aquatic therapists, registered physical therapists or those simply interested in the course material. After completing these courses, participants often complete a certification exam which includes both theoretical and/or practical elements. Participant 1 felt that those who complete these private courses could be considered and recognized in general as aquatic therapists.

The university programs providing physical therapy were often unaware of these private courses. Four of seven directors of physical therapy departments who responded to the questionnaire were unaware of any additional training available to their students upon graduation while one knew of training available in the United States but not Canada. A second knew of CARI, and a third respondent, (the owner and operator of CARI), knew of multiple training opportunities for the students. Two interviewees own APT practices in the Ottawa area, neither of whom require a private course for employment. Interviewee 7 chooses to encourage these courses once hired while interviewee 6 delivers in-house training and regularly invites experts to provide 1-day trainings within the facility. These courses are not designed exclusively for physical therapists, as other participants may register since there are no minimal requirements to register. As such, these courses are taught to an audience with varying levels of knowledge regarding rehabilitation and the aquatic environment: 'Kin, PT, PTA, OT, OTA, rec therapist, I even had in one of my basic courses.... a gal who was running programming in Ottawa'

(Interviewee 1). Interviewee 1 explained, she had a florist looking for a career change attend an APT course. Interviewee 3, who provides a training course in the United States, explained how the courses vary as well ‘it could be PTs, OTs, APT, OTA, athletic trainers, [or] water fitness instructors’. Several of the interview respondents attended courses, conferences or other forms of professional development in the United States. One respondent, interviewee 7, discussed that practitioners in Canada provide professional development activities on a lesser scale due to a lack of demand for these services:

A lot of it is in private, professional, all of our pro athletes have that access to them but there’s not enough in the community that then makes it almost a sought after...so unfortunately for the few physios in Canada that work with the aquatic environment I don’t think that there’s enough to then draw an organization to then provide that educational level.

(Interviewee 7)

An overall consensus from interviewees was that the development of APT courses in Canada responds to the extent of community and practitioner demand.

On-site training. When students graduate from a Masters of Physical Therapy program in Canada, they are able to practice in the aquatic environment. However, with minimal focus on APT within the programs, clinics hiring an aquatic physical therapist often train and educate in-house. Two interviewees discussed the need to train and educate their staff upon hiring. Interviewee 7 discussed how she and her employees received training from the private organizations as well as in-house training which she provides. She also discussed partaking in webinars through an American company which provides aquatic equipment and training. She spoke about the desire to participate in more courses and training programs provided in the United States for her staff and herself. Interviewee 6, indicated that she provides all employees

with in-house training: 'We do it all ourselves. In service training for us is 20 hours... that's before they touch the patient and they are already a physio' (Interviewee 6). With in-house training it is important to understand where such knowledge was acquired. If training is done in-house, who is providing the knowledge and education and where did they gain access to that information? If one is ensuring their staff members attend a private course offered elsewhere, what content is covered, who is providing the course, and who pays their registration (employer or employee)?

When one is relying on themselves or their current staff members to provide training to new hires, it is important to know where they acquired their knowledge and experience on APT. In these interviews, two of the respondents were aquatic therapists, but not aquatic physical therapists. Interviewee 7 (an aquatic therapist) trains staff on-site; she 'did a lot of research' in order to be able to train new hires. There is no requirement regarding who can teach aquatic material to physical therapists, permitting this scenario of non-physical therapists teaching physical therapists to occur. Interviewee 5 explained how this can cause confusion: 'I mean there really isn't any qualification out there for what I do. There's a whole variety of layers of levels of learning and experience that I have over the years' (Interviewee 5). In response to the researchers' question on what the ideal level of education and training for future practitioners should be, interviewee 5 says it is ideal to complete a Masters in Physical Therapy if one wants to provide rehabilitation in the aquatic setting. This was considered the most acknowledged form of acquiring knowledge.

II. Working towards developing standards in aquatic therapy in Canada

The second focus of this study was to understand influences on the acquisition of knowledge regarding certification and who/how aquatic therapists are certified and recognized as such. As stated previously, a graduate of a university degree in Physical Therapy (PT) may practice in land and or aquatic settings. Physiotherapists are not required to obtain additional training to practice Physical Therapy in an aquatic setting. When asked if the College regulates, or requires different standards for those working in an aquatic environment, interviewee 4 explained that if a practitioner is offering physiotherapy and they are calling themselves a physiotherapist, then the standards of practice are the same whether you are on land or in water:

The regulatory framework is exactly the same. The modalities they offer doesn't feed into the framework in which we regulate... The provisions for the standard of practice for physiotherapy are exactly the same no matter where you offer them and how you offer.

(Interviewee 4)

Physical therapists practicing in the aquatic environment are regulated by the College standards and may have gained additional training from various private or on-site employer training programs.

In the previous section, discussion focused on acquiring knowledge on aquatic physical therapy through three means: within the university program, through private courses and during in-house training. Some universities focused on practicums while other universities may choose to incorporate more focus on teaching and training in both theoretical and practical techniques, dependent on a number of issues including access to

facilities and resources. Private courses may cover a variety of topics in their courses and differ greatly between the private practices offering these training courses.

For aquatic therapists who are not registered PT, the regulation and implementation of standards is nominal and at times, non-existent. One university department head suggested: 'It would be good to be able to distinguish those who got an additional certification in their advertising' (Respondent 3). The respondent suggested that "we have a system or hierarchy where physical therapists can advertise their specialties and exploit their extra training".

Interviewee 5 suggested that aquatic training specialization could be completed after receiving an MSc in Physical Therapy, or potentially completed during the course of their degree. Multiple interviewees expressed that it would be beneficial for physical therapists with aquatic speciality to be strongly encouraged to use a distinct title when performing therapy in the water (such as aquatic physical therapist) with well-defined guidelines, making them distinguishable for the public as well as other healthcare professionals. Practitioners stated that, by not doing so, the public may be at risk as it leads to increased confusion when APTs call themselves ATs. When asked how the public recognizes the difference between aqua fitness, aquatic therapist and aquatic physical therapist, interviewees discussed how challenging it is for the public to understand the differences in service provision. Interviewee 5 expanded 'it's kind of the buyer beware kind of thing right now, they have to ask questions'. The responsibility is that of the patient to inform themselves and determine whether they wish to see an aquatic therapist or aquatic physical therapist for their treatment and/or rehabilitation.

Practitioners discussed that the College of Physiotherapy of Ontario and the Canadian Physiotherapy Association would determine if it is necessary or helpful to recognize specialized training for APT within a PT degree. One interviewee questioned

what the standard or minimum requirement would be since currently there is nothing with this level of recognition in the field. Interviewee 1 introduced the idea of creating a subdivision within the College of Physiotherapy of Ontario (CPO) which would ensure a standard of practice in the same manner that the United States implemented APT as a tiered subsection within the American Physical Therapy Association providing an APT designation. As an advocate for the field, interviewee 1 said that a few years ago: ‘I pushed them to create an aquatic division, and they didn’t want to do that, they wanted to have proof that there would be actually members that would join’ (Interviewee 1). She went on to explain that the CPA couldn’t justify the development of a subdivision due to lack of demand and/or interest.

Practitioners in the field expressed desire for improvement regarding regulation as they explained how a patient can be injured or their condition worsened if APT/AT is done incorrectly with improper techniques, or if ATs are working with patients outside of their scope of practice. One interviewee stated that certain conditions should never be treated in the water and doing so could exacerbate the problem.

Within Canada, ATs and APTs can perform therapy in water. Patients receiving APT are covered by their insurance under physical therapy, however, ATs do not have the same designation and therefore not all insurance companies will cover aquatic therapy. Every physical therapist in Canada must possess their own personal insurance and coverage which will protect them against malpractice in any environment – including aquatic. The practitioner is covered regardless of the modality as long as they have passed the national exams and are a registered physical therapist. Since Canada does not require mandatory supplementary training for APT, all physical therapists are protected. In the United States, APT is regulated separately as

a subdivision within the APTA; therefore, one may only practice APT if they are a registered aquatic physical therapist and meet the requirements to practice in an aquatic setting. Interviewee 5 describes how implementing comparable legislation in Canada would drastically affect her career:

It tends to be in my experience a lot more tightly controlled in terms of what somebody like me can do in the pool because not being a physio myself... I would have to work under the watchful eye of a physio. I would not be able to do the work in the States that I can do in Canada. Because here I have physio clinics, doctors and whoever, insurance companies, referring people directly to me and I work with them hands on in the pool and then I report back to the referring body

(Interviewee 5)

If something were to occur to a patient within the aquatic environment, a PT would be covered under their personal liability insurance. However, it was suggested by two interviewees that risk may be mitigated if aquatic physical therapists were obligated to complete aquatic lifesaving courses to provide them with the necessary skills in case of an emergency in the water.

Specifically, interviewee 5 addressed the concerns regarding basic removal of a body from the pool, falls around the pool deck, and whether there are lifeguards on duty. If fortunate enough to have lifeguards on duty, interviewee 5 suggests that 'their guards might not be trained to work with somebody who has whatever condition'. Interviewee 5 explains that lifeguards are taught the necessities but not necessarily how to work with certain at-risk populations, like post-surgery patients. Her overall perspective regarding aquatic lifesaving training for aquatic physical therapists is as follows:

It has to be addressed in any kind of curriculum around it. One of the things that I think all therapists should be taught is things like fall recovery... the safety piece is huge obviously... you have qualified guard on site is number one if that's available.

(Interviewee 5)

Not only does she believe having a lifeguard on site is ideal, but she herself has taken bronze cross medallion in the past which makes her knowledgeable about water safety for the patients. Certain rehabilitation practitioners seem more concerned about this responsibility and liability than others. However, it was clear that a minimal level of lifeguard training would be of benefit to aquatic physical therapists.

Discussion

I. Acquiring knowledge

University education. The first objective of this research was to identify different mediums in which physical therapists or non-physical therapists could attain aquatic education. It was clear that from the universities that replied to the questionnaires that most students will be exposed to two (2) hours of APT and it may be theoretical, practical or mixed. Being that the properties of water drastically change the way in which the human body moves and how resistance and force is altered on the skeletal system, it is suggested this is an insufficient amount of education. A physical therapist is not able to simply transfer LBPT techniques to the pool without increased risk of injury, drowning and potential lack of successful rehabilitation. APT requires its own rehabilitative techniques such as watsu, bad ragaz ring method, halliwick method or burdenko method (Leite, Alves, Silva, Do Prado, Do Prado & De Carvalho, 2013; Stan, 2017). These procedures and techniques are not performed in LBPT as they can only be completed effectively in the water and therefore therapists need to be educated and comfortable with them prior to administering APT with patients.

One concern addressed throughout the research was that the professors of physiotherapy programs might not possess the APT knowledge themselves. A suggestion was for Ottawa-based

APT facilities to partner with the University of Ottawa and provide work based learning in an aquatic setting. The university could outsource the training to an aquatic physical therapist in the local area and have this component presented by a guest lecturer to ensure that the students are receiving the highest level of understanding surrounding APT. Recognized networks of those in the field could work with local universities to establish common goals and develop reciprocal relationships. For example, a recognized PT working with Canadian Universities could set guidelines for guest lecturers and coordinate in-pool trainings at local facilities. This could address one of the issues raised around discrepancies in the level of additional practical training provide in PT programs, while being overseen by a Canadian representative for aquatic physical therapy.

Many interviewees suggested a larger dedication of time to APT within the two year physical therapy master's degree. It could be beneficial to allow students sufficient opportunity to apply practical therapeutic techniques of APT, and become more familiar with experiential knowledge of barriers when bringing at-risk populations into the water. If APT education was not implemented within the program as suggested previously though guest lecturers, it would be advisable that placements within APT facilities were accessible and available for interested students. It would be important that students looking to gain this knowledge be informed on which facilities implement APT and to what degree is it utilized as a modality. From this research, it was mentioned that students are often able to request certain practicum placements, but there are no guarantees students receive their desired placement. In cases where the student is placed in a facility with a pool on-site, the frequency of its use is unknown and there may not be an APT available to teach the student in the aquatic environment.

Although interviewees suggested that further training (theoretical and practical) within their degree would be the most beneficial way to ensure all students are exposed to APT training, it may be challenging to incorporate. It will likely be expensive, time consuming and logistically challenging at the University level as this would be exposing large classes to an aquatic setting. Many Universities' do not have a warm water pool on site which means they must rent elsewhere, and universities with warm water pools absorb high maintenance costs. The university would need professors proficient in providing training in APT which may also be a challenge. Interview respondents who work within training programs discussed how professors often don't know the APT techniques themselves, and are unable to provide training in an aquatic setting. The professor's competency is therefore a potential barrier to practicum teaching. For this reason, this research suggests that minimum level entry-to-practice APT skills be taught throughout the universities' master programs (entry level to practice) and that additional advanced knowledge and techniques be taught upon graduation.

Another possible solution would be for universities to provide optional means to gain specialisation within the program itself. For example, students could be recognized in aquatics upon graduation if throughout their degree, students completed a mandated number of hours through an online or condensed format course, an apprenticeship with an APT and, based on public, patient and community needs, completed a self-directed theoretical research paper. This would act as an additional certification, and recognized as training within the university degree. Requirements must remain consistent across Canadian Universities, but implementing a course apprenticeship and research paper may be beneficial for students looking to broaden their scope of physical therapy to include practice in an aquatic setting. This will likely be more feasible and the best use of resources, as students looking for this knowledge will have access without

providing in-depth training to all students registered in the program. For this reason, it may be beneficial to implement separate training opportunities for students looking to specialize in APT, however, it may be equally effective to provide a minimum amount of information to all students and allow physical therapists to choose upon graduation if they want to seek out additional training for the aquatic setting.

Private training. If this proposed option of providing an online course, practicum with an APT and theoretical-based paper is not currently feasible within the university curriculum, an alternative solution may be to draw on existing private aquatic training to fill this gap. For example, CARI courses could become a universal standard across Canada so that trainings are monitored, standardized and effective for APT teachings. Currently, these private training courses are not monitored by the college which can lead to these courses losing their value because there is no assurance that the providers of the courses are keeping up with the research, best practices and literature in the field. It would be beneficial if one course was regarded as the standard and that both practitioners and instructors alike recognized one course. Courses that can substantiate research-driven, current evidence-based information would be providing these standardized courses such as CARI in Canada and ATRI in the USA. This course would have to be overseen by the professional association as they are responsible for continuing education. By doing so, the community would be more informed and educated and would progress towards continuous improvements in APT.

This research suggests CARI is recognized as the highest level of supplementary training on aquatic physical therapy available in Canada CARI is managed by a Canadian physical therapist who is the Canadian representative for APT in international associations, and is the

leader of research-driven advancement of APT in Canada. CARI courses could provide a strong foundation for a provincial and national standard. By doing so, it would identify which physical therapists have additional training in the aquatic environment. Implementing an identification system for therapists working in aquatic setting could aid the public to identify which therapists provide which services in land and or aquatic environments.

In the United States, the APTA developed a leveling system that allows physical therapists to complete courses upon graduation, permitting them to specialize as aquatic physical therapists. Qualifications and certifications vary on a state-wide basis. This specialization of APT becomes public knowledge and patients are able to identify therapists on the APTA website with this specialized training. Within the Aquatic Physical Therapy Section of the APTA, therapists can complete the Certificate in Aquatic Physical Therapy Clinical Competency (CAPTCC) which provides fundamental knowledge, skills and abilities to ensure safe evidence-based treatment in the aquatic environment. This CAPTCC certification is sponsored by the APTA and consists of seven (7) online training modules and a three (3) day in-pool course. Ontario would benefit from one of the available privatized courses being recognized in a similar manner to the CAPTCC. If the CPO sponsored one private training program it would promote a specific training as the criterion.

By implementing guidelines and requirements, the development of knowledge would be restricted as Paul Starr (1982) explains through his theory of medical authority. Through cultural authority, those in authoritative positions are capable of conceptualizing and defining health, illness and healing. Registered physical therapists who have completed necessary training in the field of APT would gain recognition in the surrounding power dynamic which includes physicians, patients and other physiotherapists. APT treatment is inter-disciplinary in that if a

patient is seeking treatment for arthritis, they may confront competing forms of cultural authority since the physician, rheumatologist, naturopath occupational therapists and physiotherapist all attempt to provide treatment. Aquatic physical therapists will demonstrate their knowledge and treatment ability to potential patients by educating and convincing them that their service is the most effective in treating arthritis. This form of public education is defined by Starr as social authority. Aquatic physical therapists may inform the public of their services through public websites, academic conferences and educational tools. In order for APT facilities to be successful, they must inform and convince the public that their service is effective and beneficial to ensure patients listen to their voice over other competing cultural authorities.

II. Working towards developing standards in aquatic therapy in Canada

What is taught to students registered in physical therapy programs in Canadian Universities? Our research indicated a gap in literature on Canadian course content and quantity of material taught to students in the masters of physical therapy programs across Canada. This thesis explored this question, and examined the impact of education, training and certification on rehabilitative practice in aquatic settings.

Within education and training, a research objective was to understand the governance of AT and APT. The College of Physiotherapy of Ontario (CPO) clearly indicates that the way the physical therapist provides the service and the location in which it is provided does not impact the way it is regulated. The research findings demonstrate the lack of consistency within APT knowledge and information. This research proposes that guidelines for best practices be developed for APTs. These guidelines could include informing oneself on practical application of APT techniques, in-depth theoretical understanding and basic lifesaving abilities. Patients will

first turn to the practitioner if they are struggling in the water, and for this reason, it would be beneficial if the practitioner knows how to keep their patient and themselves safe in the water. By developing such guidelines, PTs could be encouraged to complete each guideline prior to providing services in the aquatic environment. Improved recognition of PTs with specialized training in an aquatic setting could potentially increase patient demand for water based treatment and encourage therapists to treat patients with a variety of modalities. It may also increase the likelihood of PT students looking to specialize in this domain. If patients know their therapist maintains a certain level of specialized training and lifesaving knowledge, patients may seek out this form of therapy more often. It would be equally beneficial for such guidelines to make a clear distinction between APTs and ATs. The public would benefit from clear differentiation between various forms of rehabilitative practices in aquatic settings, and understand that not everyone offering treatment in an aquatic setting are performing or practicing APT, nor do they have the same background or credentials as a PT.

Increased attention is also suggested to oversee the private and on-site training courses, both who provides them and who participates. Two interview participants provide aquatic training to registered physical therapists as well as many other interested individuals, yet neither of them are registered physical therapists. It is suggested that only PTs with additional aquatic training provide aquatic training to PTs. If PTs were to be trained by Aquatic Therapists, it would be up to the PT to adapt aquatic methods based on prior PT training. By ensuring PTs train PTs, the instructor can teach the material in a manner that physical therapists could better utilize the knowledge. PTs should also be training non-physical therapists looking to work as Aquatic Therapists. It would be advisable that PTs providing these training courses maintain an additional instructor-level training that would entitle them to be eligible to instruct. Without

standardized instructor education, the APT or AT course material and information may be taught inconsistently, resulting in potential safety risks for the APT and patients.

Paul Starr's (1982) framework on medical authority and regulation functions act as an effective medium to limit competing cultural authorities. By creating and implementing guidelines as to who can practice and what they can practice, only trained aquatic physical therapists could provide APT. This may inhibit physical therapists who have not completed the suggested training on best practice in a water environment. It may also increase the patients' control in finding a therapist with additional training. These guidelines may lead to increased professionalization, and create expectations around levels of training and applied practice. By developing guidelines and standards for taught recognized training on APT, the field will be capable of building greater support and recognition from patients as well as other healthcare practitioners.

CHAPTER 3: PRACTICING AQUATIC THERAPY AND/OR AQUATIC PHYSICAL THERAPY: BUILDING SUPPORT AND IDENTIFYING FACILITATORS AND BARRIERS OF PARTICIPATION

This chapter will focus on practicing as an Aquatic Physical Therapists and/or an Aquatic Therapist. This research provided insight on building support in the field, and the barriers/facilitators of APT/AT in Canada.

I. Building support for the practice of AT and APT

Aquatic Physical Therapy International (APTI) is an organization that aims to promote evidence based practices and support the development of APT on an international scale (World Confederation for Physical Therapy, 2016). The World Confederation for Physical Therapy published a list of countries that have APT organizations and individual contact representatives (World Confederation for Physical Therapy, 2016). The individual contact person for Canada was interviewed in this research. This respondent, as well as three other interviewees, spoke about the growth of the field and the support required to grow and improve the field of AT and APT. Discussion regarding building support for AT and APT consists of increasing the numbers of practicing therapists.

Many individuals from various rehabilitative or aquatic backgrounds provide rehabilitative practices in aquatic settings. Interviewee 2 explained that her AT course attracts therapists who are aqua-fit instructors looking to inform themselves in order to modify their classes to teach at-risk populations more effectively. When asked how such private training courses are organized, and whether there is a minimal education level needed to participate,

interviewee 1, summarized ‘they chose to sign up... you know they are adults’ (interviewee 1). Interviewee 1 will ask participants about their background, but there is no academic or aquatic prerequisite. Many of the interviewees who work as instructors discussed how this can become challenging since they often only have a day or two to teach the material, and the participants have varying levels of knowledge regarding anatomy, physiology and exercise. It becomes a balancing act to know how much to focus on overall body movement, potential injuries, and specific aquatic techniques.

Public awareness. Due to multiple facets of training and the lack of standard certification, it can be challenging for the public to understand what services they need and what services pool facilities provide. Many pools do not advertise therapists’ backgrounds; a point reiterated by interviewee 2: ‘It’s unfortunate, so a lot of the pools I’ve found don’t enforce who is teaching a class like that [AT and APT], that they have to have a certain level of certification to teach certain things’ (Interviewee 2). If municipal pools do not provide detailed information on a practitioner’s qualifications, an effective strategy is for participants to make enquiries as to practitioners’ level of education and training. Interviewee 5 also felt the onus lies on the potential client, ‘...it’s kind of buyer beware... they have to ask questions’.

Yet, if an individual chooses to seek out treatment, they may not be aware of differences between aqua fit, aqua fit for targeted problems (i.e.: arthritis), aquatic therapy, and aquatic physical therapy. Interviewees expressed that the public seem to view these categories comparably and as though they are all similar forms of therapy, making the public incapable of differentiating between levels of education and expertise.

In this research, interviewees expressed how commonly patients are surprised when they experience therapy does not consist of modified swimming. As such, some of the interviewees felt patients may believe they are capable of doing APT on their own, and do not want to invest their time or money on an AT or APT. They felt that some individuals may not realize the ways in which a registered APT can aid and prevent problems from reoccurring. Interviewee 7 describes:

I think that's where a lot of the public knowledge and ignorance lays... they just want to step into a pool because it feels so much better but little do they know that their movements are the same in a pool as they are in land and so, if they keep going through those bad habits, it's not going to benefit them in any way

(Interviewee 7)

Here, interviewee 7 addressed why it is important for the public to know and understand their options in order to gain the most from their rehabilitation experience.

Collaboration with healthcare professionals. It is important to understand how ATs and APTs build clientele and how individuals learn about their service. Aquatic therapists and aquatic physical therapists rely on several forms of referral in order to promote their services. All five practitioners discussed the importance of word-of-mouth from past patients who have benefited from AT or APT and have referred friends or family. As interviewee 5 explained 'It's kind of word-of-mouth... it's a small well-kept secret in the community.' Another manner for individuals to learn about AT and APT is through their healthcare practitioners including general physicians and/or land-based physical therapists, and at times, other health specialists. Interviewee 6 built an extensive mailing list of local physicians and surgeons to attract clients.

Mailing lists as such may be used to educate health professionals on AT and APT services, objectives and role within healthcare.

II. Facilitators and barriers to providing and participation in AT and APT

Building on the discussion of building support, a second area of the data analysis is focused on facilitators and challenges practitioners and clients face from a practitioners' viewpoint. It was common for multi-level barriers to occur throughout the process of providing or receiving AT or APT treatment.

Facilitators to providing and participating in AT and APT.

Practitioner facilitators and the perceived facilitators of patients were very similar. The main reoccurring facilitator for AT and APT was the positive results and effects therapy provided the patient. The largest and most influential facilitator presented was patients' reduced pain, discomfort and stiffness. Interviewees also spoke about participants' increased ability to perform daily tasks which often resulted in greater and repetitive attendance. Interviewee # 7 mentioned transitioning her patients from APT to LBPT can be challenging because the warm water is so 'so soothing, nice and comfortable' that patients are hesitant to return to LBPT. Often-times, these patients have had troubles or increased pain/difficulties while completing LBPT. Once they discover APT does not hurt or cause more pain, they are leery to return to land-based therapy.

Two interviewees spoke about certain insurance coverage programs facilitating the implementation of APT and AT as the patient is financially compensated. For Ontario patients with insurance that includes coverage of PT, they can submit their claims for APT or land-based

physical therapy, as both are provided by a registered Physical Therapist. However, aquatic therapy, as it is not completed by a healthcare professional is often not covered by private insurance. Interviewees discussed certain forms of aquatic therapy that are covered by motor vehicle accident (MVA) insurance companies, despite not being provided by a registered physical therapist. Interviewee 5 explains how she is able to bill for MVA patients despite not being a registered physical therapist: ‘I have a designation with them as a provider. So I can actually write a treatment plan for them, go directly through them and bill them directly’ (Interviewee 5). Several of the interviewees, both ATs and APTs spoke of the MVA clientele being a large portion of the patient base. If MVA insurance companies are reimbursing patients seeking APT and AT, they act as a facilitator increasing the frequency of demand.

Barriers to practicing AT and APT.

Practitioners discussed barriers and some of the challenges to providing AT or APT in Ontario. Interviewees acknowledged the greatest barriers are related to resources and accessibility. These barriers arise for many reasons including accessibility to pools with 91-93 F water temperature, available time slots, access to the pool, proximity to the pool from one’s full-time place of work, an area within the pool facility to provide land-based assessment and/or therapy, and costs for patients to receive therapy. It is rare that therapists are able to work in a facility specifically designed for APT, but even those who do may face accessibility challenges. The founder of an APT-specific facility explains: ‘We’re renting so we couldn’t [dig] down, so... now you have to walk up the stairs, you have to walk down the stairs’ (Interviewee 6).

Another APT practitioner discussed the limitations of the equipment itself. For interviewee 7, it can be challenging because the pools are relatively small and the majority of the

base is covered with a built-in treadmill. This limits the space for standing exercises that do not use the treadmill. She also raised the issue of patient height in relation to pool depth. In order to correctly and effectively manipulate the reduction of gravity on one's skeletal system, the patient must be fully or almost fully immersed. This can be challenging when patients vary from 5'0" to 6'3". She explains how she addresses this challenge by draining and refilling the pools, but this is time consuming and limited by the height of the filter which makes it nearly impossible to accommodate children for APT; this is demonstrated in figure 3.



Figure 3. Aquatic Physical Therapy participant in a HydroWorx Therapy Pool.

HydroWorx International Inc. (2017) Retrieved from: <https://www.hydroworx.com/products/hydroworx-500/>

If a practitioner is not working in a specific APT facility, they are often faced with additional challenges as they need to rent out space in community or local hotels. In both of these types of facilities, space and time is limited, and the rental fee is expensive. It is also uncommon that pools in the community or hotels are of the proper warm water temperature (91 – 93 degrees Fahrenheit) for APT. Additionally, not all these pools have the necessary lifts for those with physical restrictions, especially in the smaller hotel pools. These challenges were repeated often in the interviews, as interviewee 5 summarizes: ‘It’s got to be the right temperature, the water quality has to be good, it has to be safe, it has to be affordable. You might find the perfect pool

but it is going to cost you \$150 an hour to be there' (Interviewee 5). There were several ways in which economic challenges can hinder APT practice. As suggested by four (4) interviewees, even if practitioners are successful in locating a facility, it is often quite expensive. Interviewee 3 explains: 'Finances is one, the nice thing about working with the Y[MCA], in terms of starting out water therapy, or water exercise type situations, cost of start-up is a lot, maintenance is a lot' (Interviewee 3).

Several interviewees discussed how finances influence what services they were able to offer, the frequency, and in what location. They also discussed financial challenges for the clients, namely cost of treatment, and limited insurance benefits. As interviewee 5 explains, there are multiple factors that need to come together in order to facilitate AT and APT safely and correctly. Most interviewees expressed that it would be difficult to implement APT to the at-risk populations that could most benefit, if the necessary facilities at a good price were not available.

Safety of both the practitioner and the participant was also discussed by several practitioners. Certain conditions can be problematic; a practitioner was sent: "A referral form for a man who had uncontrolled seizures" (Interviewee 5). This puts both the practitioner and the participant at risk. Liability regarding injury or worsening of the participant's condition was mentioned by several practitioners as a potential challenge. Most aquatic physical therapists and aquatic therapists viewed having a lifeguard on site as ideal for participants' safety. Almost all interviewees discussed having some level of CPR and first aid. However, safety concerns may still be a barrier to practicing in the water.

One concern that emerged through the interviews around the issue of safety, was the immediate and long-term health concerns of the AT or APT practitioner. Interviewee 5 mentioned a practitioner who worked her entire career in the water environment, and the

potential side effects from immersing oneself continuously. While removing gravity and weight bearing for patients is beneficial to recovery, the interviewee questioned potential health impacts of therapists who spend the majority of their careers in water, as reduced weight bearing on the skeletal system can lead to lessened bone density.

Barriers to participating in AT and APT.

Practitioners provided their perceptions of barriers for patients participating in the water environment. These perceptions were based on what they have seen or been told by patients. Concerns were similar for therapists and patients with regard to accessibility and economic issues. One interviewee explained how she believes accessibility to the pool in terms of lifts and assistive devices, time slots and the facility itself can all be a challenge: 'It's all about access because an individual who is unable to access a fitness community center needs a bridge to get there' (Interviewee 3). Interviewee 3 went on to explain how she works at a facility which offers a sliding fee scale for participants. She acknowledges that this is a great start, but transportation to the facility is often still a barrier.

Interviewees also identified many perceived potential barriers for individuals to immerse themselves in water. These issues ranged from getting changed into a bathing suit, water temperatures, wet hair, anxiety around water, open wounds, body image, and health concerns about water cleanliness. Most aquatic therapy facilities offer both land and aquatic therapy – some interviewees discussed issues around treatment sequencing and transitioning from one environment to the other:

The hardest part is just figuring out how they are going to do it afterwards because most people do not have a pool at home, a lot of people don't have access to a pool once they're done... alright so we know that at some point we are going to have to transfer them to land based

(Interviewee 3)

Interviewees expressed that participants are often hesitant to begin AT or APT as they know they will have to overcome transitioning back to the land environment after rehabilitation.

Practitioners discussed transitioning patients during the last couple of sessions to ensure they have exercises they can do on their own. A repeated concern was that individuals run out of coverage before completing treatment and recovering. One therapist spoke of the potential to offer clients the option to transition from aquatic physical therapy to aquatic exercises instead of land based practices: 'I am creating a program for instructors who are aquafit instructors to learn how to do essentially post rehab classes. They're a nice transition from "I'm under the therapist's thumb" to "I'm back up to normal"' (Interviewee 5). Many of the therapists interviewed stated that they try to educate their patients on post-treatment options. Some provide a list of warm water pools in the local area that offer appropriate classes while some discharge to a specific knowledgeable aquatic therapist, who will likely charge less than the APT. Other practitioners discharge clients with an exercise sheet so they can go to community pools of their choice and complete their exercises.

Discussion

This research provided insight into the field of rehabilitative practices in aquatic settings including how therapist build support for their practice and the facilitators/barriers to providing and participating in AT and APT. There is limited knowledge on the field regarding the growth

and progression of AT and APT in Canada and while there is some literature regarding the barriers, research identifying facilitators is scarce.

Building support. The first major objective of this research was to examine the building of support for AT and APT. The difference between APT, aquatic therapy, and other water-based activities was examined while acknowledging how they are portrayed to the public. Public uptake of knowledge, and insurance companies support or lack of support of certain aquatic services was also explored. The research looked to determine how APT practitioners build their practice and gain clientele through support from the College of Physiotherapists of Ontario (CPO), other healthcare practitioners or patient testimony.

The data analysis revealed areas of potential areas of confusion for patients seeking out AT or APT. Distinction between therapists is unclear and therefore it is in the hands of the practitioners themselves to build and develop support for one's practice. By optimizing training opportunities and recognition of training, through schools, private facilities or on-site, practitioners will be more confident with their evidence-based practices and patients will in turn feel more comfortable partaking in AT or APT. This will lessen the potential for confusion or unequal levels of care and practice. It is suggested there is difficulty understanding what service is provided, who is providing it and their background training. By creating support for APT through practitioners advertising their experience, training and ability, the field would be able to progress and grow in ways currently out of reach. It would be valuable to lessen this confusion through recognized education, training and certification and that the public is capable of identifying which practitioners are providing which services. In order to differentiate oneself to appeal to potential patients, therapists must build support for their services, techniques and

practices. By gaining support from healthcare practitioners, advertisements in the community and word-of-mouth from patients, therapists can gain recognition and increase clientele. While building support for one's practice, an APT must differentiate from an AT and vice versa. Although APTs must be registered physical therapists and ATs can possess various backgrounds, it is unclear if both groups' therapists use similar techniques, methods and treatments. An additional reflection relates to discussing why there are distinctions, what is included in the PT curriculum that is specific to APT, and whether these distinctions and subsequent trainings are in the best interests of Canadian health care.

Students in the physical therapy (PT) graduate program in Canada have varied experiences and training to provide physical therapy in an aquatic setting. It may consist of a lecture plus in-water training, or it could be solely based on course curriculum within one lecture. Some graduating PTs may wish to receive specific training in physical therapy in an aquatic setting and so register in privately-run in-water training sessions offered through weekend courses. For the most part, these private trainings are open to any individual who is interested in registering. Thus, a PT graduate will be learning the same techniques as the 18-year-old high school student who would not have the same base education as the PT graduate. Their backgrounds and initial education vary considerably, but they receive the same certificate upon completion of the weekend course. As previously suggested in this discussion, this research proposes that PTs receive their training from PTs who are already specialized in this domain.

Creating cultural authority on aquatic physical therapy in an international context.

The World Confederation for PT was established in 1951, and provides discussion and resource sharing around APT (World Confederation for Physical Therapy, 2016). An affiliated network to the WCPT is an organization entitled Aquatic Physical Therapy International (APTI), based out

of Switzerland aims to promote evidence-based practices and supports the development of APT across the globe (World Confederation for Physical Therapy, 2016). In the United States, there is a subsection for APT within the American Physical Therapy Association (APTA) which allows therapists and patients to be protected and it encourages a standard of care for those in rehabilitation in aquatic settings. The drive for change in the USA began prior to 1992 when two professionals started a petition, completed proposals and lobbied for an APT section within the American Physical Therapy Association (Irion, 2002). The United States recognizes APT as an independent modality for rehabilitation and allows for therapists to separately bill insurance companies based on a timed services, attendance or required supervision (Example: Code 97113 Aquatic therapy with therapeutic exercises (15 minutes) \$35.35 (WebPT, 2016).

In the UK, the Aquatic Therapy Association of Chartered Physiotherapists (ATACP) is recognized by the national Chartered Society of Physiotherapists. It provides research, knowledge and insight for physiotherapists and physiotherapy assistants working in the aquatic setting. It sets the standards for physiotherapists working in the water and maintains world-renowned courses, training and certifications (ATACP, 2016). Unlike Canada, in the UK physical therapists must start by taking an Accredited Foundation Programme in Aquatic Therapy which is a two-day course provided by several Aquatic Physical Therapists endorsed by the ATACP. Once completed, therapists can continue on with courses such as Orthopaedics, Neurology, Intermediate Musculoskeletal, or Aquatic Physical Therapy for Neurological conditions. These courses can only be taught by accredited ATACP tutors and can only be completed by registered physiotherapists. In order to attain an ATACP endorsed certification, one must complete a case study, a written examination and a practical assessment of skills. Each participant is entitled to a mentor with whom they are allotted two (2) hours for guidance and

assistance throughout the certification phase. If a rehabilitation professional in the UK wishes to become knowledgeable in the aquatic environment but is not a registered physiotherapist, they can attend ATACP's study days which provide opportunities for physical therapy assistants, students, and other rehab professionals to cover varying themes and aspects related to aquatic therapy which are led by ATACP tutors. These study days are held twice a year and are informative but attendees do not gain any accreditation upon completion. This is how the UK successfully differentiates between physical therapists trained to perform therapy in the water, and other rehab specialists who have knowledge about the aquatic environment but are not certified to practice APT.

Building social authority on AT and APT. Social authority can be constructed by aquatic physical therapists or aquatic therapists as they try to convince the public to seek out their services. Physical Therapists, Kinesiologists, Occupational Therapists, lifeguards and aqua-fit instructors are all competing for a space within the power dynamic of aquatic rehabilitation. Any of these individuals may register and complete a private training course, and become capable of providing therapy in the water. Yet, their educational backgrounds, experience and knowledge can vary greatly. For example, CARI is an internationally recognized, research-based training program created by a physical therapist participate in their program over others. Social authority is constructed in aquatics as therapists must compete and convince the public that their education, knowledge and treatment ability is well-recognized. Therapists can construct this form of social authority through multiple mediums including recommendations, word-of-mouth, patient testimonies and promotion of certifications and education. Facilities looking to increase their clientele will look at strategies to enhance public recognition of their authority and

expertise, and encourage potential clients to seek their facility for aquatic therapy or APT over another. This process of accumulating social authority occurs through advertising in hospitals, newspapers or doctors' offices. Social authority is also strengthened when past clients provide testimony on good results to future clients or to their surgeon/physician/referring body.

Aquatic physical therapists may seek out relationships with orthopaedic surgeons, or family physicians in the local area to develop their social authority through recognition by other healthcare professionals. Displaying certifications and degrees may also function as a method for practitioners to gain social authority as the general public becomes convinced of their competence. Development of research and generating knowledge can also correlate to increased social authority. For example, in the United States, social authority has increased through publication of research journals dedicated to APT. This is particularly valid in the case of The Journal of Aquatic Physical Therapy, the primary peer-reviewed journal published by the American Physical Therapy Association that serves to mobilize research knowledge on APT. Lastly, insurance companies have the opportunity to lessen or enhance the social authority of therapists. For example, if insurance companies only provide coverage for services provided by a registered physical therapist, clients may intentionally only seek out aquatic physical therapists to reduce their expenses in seeking treatment. Gaining and constructing social authority aids aquatic physical therapists and aquatic therapists to build their practice and support for AT or APT.

Facilitators and barriers. The last research question sought to identify facilitators and challenges related to practicing AT or APT for therapists and the therapists perspective on the facilitators and barriers to participating that patients face. Prior research identified facilitators such as the participants' confidence in performing the movements, knowing the exercises were

of value, short duration of sessions and a mid-intensity were likely to encourage participation. Unlike current literature, this research demonstrated the main facilitator for AT and APT was the patients' results upon completing an aquatic session. The warm water and removal of body weight allows the patient to feel very comfortable while completing the session while decreasing edema and stiffness acts as a lasting result once the patient has exited the pool. After multiple sessions, the patient would experience the entirety of benefits including increased strength, range of motion and balance. Some physiological facilitators occur in the water, others upon completion of treatment. Often these improvements have different lengths of effectiveness which may influence the duration and frequency of patients' treatments. These facilitators may be used to promote, advertise and increase social authority for AT and APT by informing the public why patients continue to use AT or APT treatment. By increasing awareness of facilitators, the public may be more likely to participate in this form of therapy. Increased participation may also occur through mitigating and limiting potential barriers.

This thesis identified barriers and challenges that encouraged the researchers to provide suggestions to address issues raised through the data analysis. Most interviewees discussed the issue of accessibility. It is difficult to secure rental availability of warm water pools with the correct lift and assistance equipment within the community or hotels. For this reason, it is suggested that more municipal pools increase the water temperature and install proper lifts in current warm water pools to increase availability of APT in a public setting. Many of the newer municipal pools are configured to comply with provincial regulations on accessibility. This would address the issue of resources and lack of facilities. Currently, there are only two (2) facilities in the Ottawa region that are specifically built for private APT. Both of these facilities

in Ottawa discussed opening another location within the next couple of years, and hopefully this will enable more effective access to APT.

Similar to research published by Terrens et. al. (2017), feasibility and cost-related concerns were a common challenge identified in the data analysis. APT is expensive for practitioners to implement, provide and complete. Although insurance companies in Ontario cover APT provided by a physical therapist, the high costs associated with APT means participants may have only three (3) or four (4) sessions covered before running out of insurance. Sessions are often more expensive than traditional LBPT and since insurance coverage works on a dollar amount versus the number of sessions, patients do not receive enough coverage to complete rehabilitation. It is suggested that patients be allotted a greater maximum dollar amount for APT or that insurance companies cover APT in a separate category as well as land-based physical therapy. It is also suggested that all insurance companies consider recognizing aquatic therapists with allied-health backgrounds (i.e. athletic therapists, Kinesiologists) who complete the proposed second level of training as insurable and covered. This category could be available as a more feasible transition once they have been discharged from APT. These practitioners would likely charge less per session and may offer group formatted services which could also lower costs.

Barriers such as water anxiety and safety concerns would be mitigated if therapists were required to complete a minimal level of lifeguard training which could reassure the patient. Adaption to very shallow water can be introduced, as can waist-belt personal flotation devices. Interviewees discussed a challenge for patients transitioning from the end of their therapy in water to continuation of physical therapy on land. Patients were unsure when this transition should occur but the data analysis did not reveal specificities related to potential problems

patients might have with adjusting environments. More research is needed to understand challenges when transitioning from water to land, changes in the techniques, and impacts of these changes on the patients' recovery. This will help practitioners understand how to make this transition smooth and successful for participants.

For the most part, the barriers and challenges identified through this research complement earlier studies. In this literature review, several intervention-based research focused on comparing patient pain levels between LBPT and APT programs. Hinman, Heywood & Day (2007) discussed how APT lessen pain and joint stiffness while increasing strength and physical function in comparison to no intervention. Vivas, Arias & Cudeiro (2011) concluded APT showed improvement over LBPT on certain outcome scales but not all. Villata & Peiris (2013), Park et al. (2016), and Palamara et al. (2017) presented similar results for both APT and PT intervention and concluded that both physical therapy protocols are effective. APT is significantly more expensive to operate, provide and maintain in comparison to LBPT while the results are not consistently more effective as compared to land-based techniques. Prior literature describes the lack of evidence supporting APT as superior to LBPT (Redfern et. al., 2008; Terrens at al., 2017). Until research can complement patients' experience through APT intervention, it is unlikely that the demand will increase drastically. This research indicates that the largest facilitator for practitioners and participants were the results and improvements patients attain. Researchers continue to build on current studies to flesh out specific benefits that APT could provide in conjunction with LBPT, or as a stand-alone treatment modality. More research and studies are needed to drive research in this area to encourage new questions and knowledge development. In turn, this will further develop the field of study on APT.

CHAPTER 4: MOVING FORWARD: RECOMMENDATIONS, CONCLUSION, STUDY LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The purpose of this study was to further understand the practice of aquatic therapy and aquatic physical therapy in Canada, and specifically within Ontario. A review of literature reveals the strong corpus of research on clinical benefits and effectiveness derived from AT and APT (Becker, 2009; Leslie, 2006; Prins, 2010, Wilk & Joyner, 2014). Yet, less is published on the practice of AT or APT in Canada (Bonnyman & MacIntyre, 2012). As such, this research was exploratory in nature and contributed to the understanding of how cultural and social authorities are constructed among stakeholders in aquatic therapy and aquatic physical therapy in Canada.

This fourth and final chapter will outline the major recommendations suggested by the researchers upon completing this study. It will discuss the ideal three-tiered system for recognizing therapists' skills, the desire for standardized training and education, and that the College of Physiotherapists of Ontario begins to categorize APT as a subsection. A conclusion will be summarized and study limitations will be addressed. This chapter will conclude with future research directions that will encourage researchers to continue to develop evidence-based information on APT and AT.

Three-tiered system

In Canada, there is no distinct section for APT within PT. In order to aid in differentiating between ATs and APTs, it would be beneficial to develop courses with requirements and certifications that distinguish individual participants. It is suggested that three separate training

courses be developed. In all courses, the participants should confirm they have the ability to swim. The level one course would be developed for participants who are personal trainers, lifeguards, aqua fit instructors or anyone interested in learning more about the benefits of water. This course would have no minimal requirement except the capacity to swim. They would not be authorized to use the term aquatic physical therapist or aquatic therapist. Based on the discussions with interviewees, the level two course is suggested for other rehabilitation professionals including Kinesiologists, Athletic Therapists and Occupational Therapists. It would be mandatory for participants to have a degree in the field of rehabilitation, so the instructor knows they have a baseline knowledge prior to learning about aquatic therapy. These participants would use the title Aquatic Therapist and would be able to then offer aquatic therapy in their respective domains (i.e. aquatic Kinesiologist, aquatic Occupational Therapist). Lastly it is suggested a level three course would be the most recognized course for patients who need rehabilitation in an aquatic setting. Only registered physical therapists would be able to complete this course and it would be taught by registered physical therapists who have specialized knowledge and experience in the field of APT. It would be the most advanced training and content available for APT and it could be recognized by the College of Physiotherapy of Ontario (CPO).

Implementing this tiered system could encourage the CPO to develop a database for all level-three aquatic physical therapists in the province. Similar to the directory system for land-based physical therapists, the public would be able to search for aquatic physical therapists in their local area. It is suggested within the level two and three courses, that sub-qualifications be available for specialization with certain at-risk populations such as those living with Multiple Sclerosis, Parkinson 's disease and Osteoarthritis.

Overall, a system like this could make it easier for the instructors to teach courses for targeted audiences, and for the public to understand the services they receive, and the level of education and training of the provider. These courses could be titled level one (1) through three (3). Private companies currently providing training could continue to do so, but in a three-tiered system. This form three tiered system would be supported by interviewee 5 and they suggested aquatic training specialization completed after receiving an MSc in Physical Therapy, or potentially completed during the course of their degree.

If such a system were put in place, it may facilitate aquatic physical therapists and aquatic therapists in building support for their practices. The field would become more established as formal education and training would be recognized by streamlining the post-graduate training opportunities. This would allow aquatic physical therapists and aquatic therapists to build greater social authority and improve their potential to promote their services to healthcare professionals and the public. Implementing a universal three-tiered education system would enhance the development of social authority for aquatic physical therapists and remove it from lifeguards, personal trainers and interested individuals. This may lead to a safer and more effective growth of the discipline. Another suggestion is to expand training on APT, including in-water practicum, in all PT programs in Canada. Students could receive up to two full days of theoretical and in-pool practical training. The practical application would not have to be done in warm water pools; universities could teach their students in the on-campus swimming pool to provide hands-on education and the ability to implement new techniques and methods. This practical education could be provided by an outsourced private aquatic physical therapist in the community.

Constructing and consolidating social authority on aquatic physical therapy occurs in several ways. Paul Starr's (1982) theory on medical authority describes how North American

doctors gain and attain power through cultural and social authority. Cultural authority is the power physicians acquire to conceptualize and define health, while social authority is their power to convince the public of their ideas and thoughts regarding health and how the public accepts, negotiates or resists their advice. Following these theories, the researchers analyzed how social authority is gained within APT. Through the data analysis, the ways in which the research participants constructed their social authority was fleshed out. Social authority is constructed on multiple levels within APT. Individuals creating and providing APT private training courses construct social authority in order to convince therapists who wish to specialize in the aquatic environment that their specific training course is the most valuable. In order to gain clientele and increase the demand for such services, companies advertise through rehabilitation magazines or forums, provide certificates of completion and attempt to become the most recognized source of training across the country. This form of social authority is clear between companies such as ATRI, CARI or Water ART who all provide similar training courses to the same audience. In order to differentiate from the others, companies must build and gain the most social authority.

Recommendations

What are the recommendations moving forward? Multiple areas were identified for improvement. An underlying concern is the need to better understand the level of education and training a practitioner receives, and the impact it has on providing therapeutic treatments in an aquatic setting. Overall, it is suggested that training and education become standardized for physical therapists that chose to also provide services in an aquatic setting. This could be integrated at the university level to include both theoretical and practical training within the curriculum. Prerequisites would be beneficial for implementing the 3-tiered course system and it would provide direction for the instructors regarding background knowledge of participants.

It is also suggested that it may be beneficial for the College of Physiotherapy of Ontario create a sub-section of APT that would group together passionate practitioners and researchers. It could facilitate networking and knowledge building already underway. It could enhance synergies within the university PT programs, and resource dissemination through conferences, journals, and newsletters. This enhanced capacity to educate, train and develop practices in APT could also reduce potential concerns related to liability and safety of the patient in the aquatic environment. Issues on accessibility, including financial concerns, could be mitigated through various means including enhanced insurance coverage. It may be beneficial if insurance companies assess their coverage of LBPT and APT to allow for a larger maximum dollar amount for PT, or allot coverage for both LBPT and APT separately. The data presented in this thesis was somewhat contradictory on this issue as some interviewees discussed insurance companies providing coverage for patients' despite the therapist not being a registered physical therapist. This was more common with Motor Vehicle Accident patients. More research is needed to understand why motor vehicle insurance companies provide coverage for aquatic physical therapists and aquatic therapists. It would be beneficial to understand what motor vehicle insurance companies consider as sufficient education, training and services for their clients to receive insured services in aquatic therapy.

Conclusion

This study drew from qualitative methods including questionnaires and semi-structured interviews. Questionnaires were sent to all fifteen (15) Canadian universities offering a graduate program in physical therapy of which Department Heads from seven (7) universities responded. Also, semi-structured interviews were conducted with seven (7) stakeholders in the field of APT

and one e-mail exchange with an individual in the legislative domain of PT. Recruitment for the interviews was based on the individual's experience, knowledge and expertise in the field of AT and APT. Interviewees were considered key stakeholders based on an environmental scan that identified individuals who were connected to the largest and most established associations, organizations and facilities for AT and APT in Ontario; specifically Ottawa. Categories for key stakeholders included: registered aquatic physical therapists, aquatic therapists, private training course educators for APT in Canada and in the United States, the College of Physiotherapists of Ontario (CPO) and the Canadian Physiotherapy Association (CPA).

Interviews were conducted with registered physiotherapists working in the aquatic environment in the Ottawa area, non-physiotherapists working in the aquatic environment, educators providing courses on APT and AT in Canada, educators providing courses on AT in the United States, the College of Physiotherapists of Ontario (CPO) and the Canadian Physiotherapy Association (CPA). Through this data collection, the purpose was to better understand the ways AT and APT is being provided, advertised, supported and administered in Ontario, and specifically Ottawa.

Through critical analysis, this thesis examined the way in which social and cultural authority is constructed within the field of AT and APT and was capable of answering the three major research questions while providing recommendations for improvements. This research identified the three major ways aquatic physical therapists attain their knowledge on aquatic physical therapy: through university curriculum, private training courses and in-house within facilities where they are employed. This thesis explored facilitators/barriers to practicing and receiving aquatic therapy, and suggested recommendations based on the data.

This thesis presented four chapters. The first chapter provided an introduction which outlined the background, research topic, questions, literature review, theoretical framework, methodology, and epistemology. Chapter two focused on education, training and certification of AT and APT in Canada. Chapter three focused on the development and progression of AT and APT, the building of support, and the facilitators/barriers to participation. This chapter, chapter four, consists of future recommendations, conclusions, limitations and future research directions.

Chapter two begins with results concerning education, training and certification. The researchers looked to understand what the universities are providing to physical therapy students, what private training courses are available and what additional certification processes are in place. The USA was used to understand their implementation of AT and APT and potentially provide for future suggestions in Canada. This research revealed how an individual becomes an aquatic physical therapist or an aquatic therapist. Aquatic physical therapists acquire knowledge through university programs and in-house trainings while they also have the option to enrol in additional privatized training. The inclusion of content on aquatic-related physical therapy largely depended upon who was teaching that particular course, and the warm water pool facilities at the university. Most physical therapists interviewed in the study felt they needed specific training on APT before they felt comfortable providing that treatment in a pool setting. There are many private settings to acquire specialized aquatic training, from a weekend training offered at a pool by an APT, to an entirely online course without any in-person instruction or practicum taught by an AT. Neither of these courses are recognized by the CPO nor the CPA, and physical therapists can register in these courses the same way as a lifeguard or high school student. Participants suggested a known specialization for APT be created to implement standards of training, and ensure safe practice.

Aquatic therapists gain knowledge and information through private courses or trainings. There is no standard certification or course that individuals must complete in order to provide AT. It is important to know how APTs and ATs acquire their knowledge because it allows us to better understand the overall state of rehabilitative practices in aquatic settings, how they are implemented and how standards are maintained to enhance client safety and effective treatment. By completing this research and providing suggestions, AT and APT has the capability to reach a larger audience and aid with participants' recovery through rehabilitation. By considering the perspective of practitioners, it contributes to the literature in socio-cultural aspects of AT and APT.

A main theme that emerged from the data analysis was the confusion around the title 'APT' and 'AT' regarding who could provide aquatic physical therapy and who could provide aquatic therapy. APTs have all completed a university degree and are registered PTs. Participants within the private AT courses were from a broad cross-section of society, yet they all completed some training and received a certificate. There are multiple courses available to those looking to provide aquatic therapy, but none are standardized or mandatory. This may create a confusing environment for the public as there are different certifications therapists may possess but potential clients may be unable to differentiate. It is suggested that standardized courses be developed with a three tiered level system that is recognized by practitioners and the public. In summary, level three would be for physical therapists only, level two would be for healthcare professional that are not physical therapists and level one would be for lifeguards, personal trainers or simply interested individuals. Level one would mimic the United Kingdom's study days. In the UK, they provide 1-day courses to provide further information for those interested but it is a basic level of AT including anatomy and physiology fundamentals and basic APT

methods and techniques. Upon completion, participants are unable to use the term aquatic therapists or aquatic physical therapist.

The second major theme in this thesis focused on examining how providers build their practice. The researchers delved into how therapists build support for their practice, either through the regulatory College, physician referrals or patient testimonies. The data presented was contradictory in that some participants saw physicians increasingly educating their patients on AT or APT services, while others saw a need to further educate physicians on when to teach their patients about AT or APT options for acute and chronic pain. Interviewees expressed that physicians with certain backgrounds and specializations (such as orthopaedics and neurology) are more likely to propose rehabilitative practice in an aquatic setting as a resource for rehabilitation. Physicians, PT and other health care provider referrals are important for increasing the outreach of APT. However, this study identified that private insurance companies may limit patients' ability to complete APT as their coverage runs out before recovery. This research revealed most practitioners built their cultural authority on AT or APT through formal education, private training courses and experience. Several of the participants interviewed in the study revealed their strategies to build social authority in the public by seeking referrals through physicians, patient testimony, social media/websites, creating their own business offering APT, developing relationships with physicians and displaying of certification and education.

Competing tensions were noted between different private training courses, and authority was established by practitioners with a PT degree and affiliation with a University. This research identified the need for clear guidelines and communication on the types of aquatic therapy provided, level of training and qualifications, and potential for rehabilitation. The field and the

public would benefit from transparent descriptions on levels of care, techniques and methods used by the diverse field of practitioners in an aquatic setting.

Lastly, this research examined the challenges and barriers to participation for both the patients and the practitioners. Overall, barriers were shaped by accessibility and feasibility. Rehabilitative practice in an aquatic setting is very expensive for both the practitioner and patient. The practitioner must rent out space or pay to maintain and build a pool while the patient must pay for the transport and higher cost of the treatment, compared to land-based PT. Accessibility to treatment, especially considering transportation to the suburban locations of many warm water pools can be a determining factor. Other challenges surfaced around the need to find a pool with the preferred 91-93 F temperatures, availability of a rental space or maintenance of a permanent location and therapists who work out of land-based clinics may need to travel far to the aquatic setting.

For patients, concerns were noted on the process of getting in and out of the pool safely, especially for certain populations such as the elderly. It can also be difficult to get to the facility, use a lift or ladder to enter the pool, pay associated expenses, access insurance coverage, and combat personal concerns such as water anxiety and immersing one's head. In order to address these barriers, the goal would be for APT patients to participate in facilities built specifically for APT, and for insurers to cover larger maximum amounts, lessening the financial demand. Interviewees also suggested: more in-pool training during the PT degree, greater concern given to risk and safety of these populations in the pool and municipal pools increasing the temperature of their warm water pool and constructing appropriate lift devices. A reoccurring suggestion provided by interviewees is to require mandatory lifeguards on duty while one is completing AT or APT. The water environment increases concerns of drowning along with other risks identified

by the Public Health Agency (2011) such as swallowing water, reactions to chlorine, and the increased risk of falls entering and exiting the pool. It is recommended that therapists either attain the required education level to function as a lifeguard in a time of need or that they only practice in facilities with trained lifeguards on site.

This research addressed the gap in the literature regarding the implementation of rehabilitative practices in aquatic settings. Qualitative methods were conducted in order to gain further understanding of the progression of the field. Data collection was conducted through June and July of 2017 with physical therapy programs across Canada, as well as stakeholders in the field of AT and APT in Ontario. The findings revealed a need for increased standardization of training, eligibility and implementation of AT and APT in Ontario. It also demonstrated the need for transparent communication and transmission of information to the public, so the population knows who would benefit from treatment and where to receive it.

This research thesis situated these findings with Paul Starr's theoretical framework on medical authority (Starr, 1982). Cultural authority implies the power to conceptualize and define health, illness and healing; and a social authority, which encourages the public to accept their advice (1982). This theoretical framework was adopted as two distinct processes in this study were identified: to become an aquatic physical therapist or aquatic therapist, and shape cultural authority on the topic; and to practice AT and APT, and gain social authority of the public through building support and networks. Practitioners who wish to gain clientele and increase their implementation of AT or APT must gain social authority by portraying effectively and teaching the public and other healthcare professionals that their services are available and practical. Therapists' ability to provide concrete proof of standardized training would aid in building one's social authority.

Due to the lack of guidelines regarding who can practice therapy in the water, there are many competing voices attempting to sell their service as the best treatment. Differences in educational backgrounds, licenses, experience and knowledge vary between therapists, yet they have all completed some form of training courses and therefore provide AT or APT to potential patients. In the same manner, private training courses are competing to convince therapists that their training courses are the most beneficial. In this sense, the authority of certain training courses may cross over to influence the public themselves if they have heard of particular training courses over others. In this case, potential patients may seek out therapists with specific certifications. Cultural authority can exist on multiple levels and insurance companies play a role influencing the participant's choice. Private insurance will provide coverage for therapists who hold a degree in physical therapy, and therefore can influence which facility patients choose and which training courses therapists complete.

This thesis addressed concerns surrounding aquatic physical therapists/aquatic therapists, their education, implementation of AT and APT and AT certifications. When a field such as AT or APT is in the early stage of development in Canada, as with any advancement in healthcare, research leading to new or improved procedures/techniques requires critical assessment. As the field of AT and APT continues to grow, further discussion around training, and scope of practice should ensue. Overall, it is critical to know that healthcare professionals, and in this case, aquatic therapists and aquatic physical therapists possess the knowledge, education and ability to successfully provide AT and APT effectively and safely. The suggestions provided below will hopefully engage future discussion and reflection to ensure provision of qualified AT and APT personnel in Canada.

Study limitations

There were several limitations with this research, including limited in-person access to stakeholders as researchers are located in Ottawa. Interviews conducted with participants outside of Ottawa were completed over-the-phone. Over-the-phone interviews reduced the researcher's understanding of body language and social cues. As such, only vocal cues, laughing or other sound-based cues could be noted.

The interviews with Ottawa area stakeholders included participation from owners of facilities providing APT. It could have been beneficial to also include participation from aquatic facility owners that just provide AT, as well include patients' perspectives. The sample size of 15 was somewhat limited and comprised of seven (7) questionnaires, seven (7) interviews and one email exchange. Nonetheless, the research represented a variety of key stakeholders in the field who provided reflection and insight into the research questions.

The research results presented in this thesis are not generalizable. This is not a limitation of the study; it is an internal characteristic of qualitative research. However, it is important to understand that the recommendations and conclusions provided in this thesis are specific to the location and time of data collection, the individual participant's perspectives, the current state of AT and APT and each participant's biases. Purposeful sampling was utilized to gain perspectives from stakeholders in the field, however without random sampling, it is impossible to generalize that these findings are representative of larger populations. Generalizability and transferability was not the goal of this research nor is it the goal of qualitative research; the deeper understanding of what is occurring and why, was the goal for this research.

Future research directions

This research was exploratory by nature and identified many areas for future studies and research to be conducted. Future studies will help develop a complete understanding of AT and APT and its implementation in Canada. Specifically, more qualitative data is needed with members and representatives from private AT and APT clinics across Ontario and Canada. It would be beneficial to gain multiple viewpoints from employees of the Canadian Physiotherapy Association and the College of Physiotherapy of Ontario. Engaging with practitioners from the United States, as well as members from the American Physical Therapy Association, would be helpful to understand how they created a sub-section of aquatic therapy within the American Physical Therapy Association. Regarding the private training courses, it would be beneficial for future studies to review what each course provides, the course material and the time allotted to each topic. It would be beneficial for research to examine the evidence on effectiveness of these private training courses in the USA and their tiered leveling system of training. Understanding the content delivered in these courses (in both Canada and USA) and how ATs and APTs put this knowledge into practice is crucial to developing prerequisites for these courses as well as increasing the courses' social authority. It would be helpful if further research examined what each university PT program provides within its APT section in order to further facilitate all PT students gaining access to standard APT knowledge.

Further research is needed to flesh out facilitators and/or barriers that exist when transitioning from water to land-based therapy from both patient and practitioner perspectives. It would be advantageous for future research to identify what techniques, methods and adaptations APTs use with patients in comparison to what techniques, methods and adaptations ATs do with

in-pool with patients. This would enhance our understanding of what services are provided by each type of practitioner, and help to guide patients towards the most suitable practitioner.

Further research with patients would provide data on their perspectives and further develop the understanding of how patients view therapists' education, certification and build support to influence their choice regarding participation. Research could also focus on understanding how insurance companies decide to accept or decline payment. It would be interesting to understand why car insurance companies will cover patients in a motor vehicle accident seeking APT or AT while extended health plans only cover APT.

The thesis contributes to our understanding of aquatic therapy in Canada. Current literature focuses primarily on interventions, identifying the benefits of AT and APT and the development of new technology and techniques in AT and APT. This research contributes to this literature by analyzing research-identified themes on education/training, building support and facilitators/barriers of AT and APT. Recommendations and areas for future research included specialized training courses by scope of practice, and increased in-pool practicum training within PT program curriculum across Canada.

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APPENDIX A

Université d'Ottawa
Faculté des sciences de
la santé

École des sciences de
l'activité physique

University of Ottawa
Faculty of Health
Sciences

School of Human Kinetics

Project title: Contextualizing the Development and Practice of Aquatic Physical
Therapy in Canada

Supervisor:
Dr. Eileen O'Connor
School of Human Kinetics
Faculty of Health Sciences
362 Pavilion Montpetit
125 University Street
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Graduate Student:
Alyssa Ashton
School of Human Kinetics
Faculty of Health Sciences
362 Pavilion Montpetit
125 University Street
University of Ottawa
Ottawa, On K1N 6N5

Invitation to Participate: I am invited to participate in a research project entitled Contextualizing the Development and Practice of Aquatic Physical Therapy in Canada. This research is led by Alyssa Ashton, MA student, and supervised by Professor Eileen O'Connor of the University of Ottawa.

Study Purpose: The purpose of the study is to gain a better understanding of the development of Aquatic Physical Therapy in Canada, and its current state of training, practice and management.

Interview Participation: My participation will consist essentially an interview that is 45 to 60 minutes long. I will answer questions about my knowledge of aquatic physical therapy, and its current state of practice. The interview will take place in Spring/Summer 2017 in an agreed upon public location. I agree that my interview will be tape recorded and transcribed. I will receive access to the transcript of my interview through email via password-protected google docs and will have the opportunity to make any necessary changes.

Risks: I understand that my participation consists of answering questions about my knowledge of the field of Aquatic Physical Therapy. I am free to refuse to answer any question that may create discomfort. I understand that I may withdraw from this research at any time.

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École des sciences de
l'activité physique

University of Ottawa
Faculty of Health
Sciences

School of Human Kinetics

Benefits: This study seeks to address this gap by providing context and knowledge on the inclusion of APT in Canadian university curriculum, and among practitioners. My participation in this research will benefit the development of knowledge in this field of practice, ensuring the voices of private practitioners are included. Participation in this study provides overall benefits to the field, contributing new information and knowledge regarding Canada's integration of APT within the field of rehabilitation.

Confidentiality and anonymity: I have assurance from the researchers that the information I share will be kept strictly confidential. I expect that the content be used for this project only, and dependent on confidentiality. Anonymity is guaranteed. I will be asked to choose a pseudonym (false name) that will be used during the transcription of my interview. If portions of my interview are quoted in the research, the same pseudonym will be used and information pertaining to my identification will be removed.

The researchers have my permission to use quotations from my interviews in their knowledge outputs including conference posters, journal manuscripts, and a public research summary. My identity will be kept anonymous and a pseudonym used. I will be emailed a copy of these knowledge outputs when my quotations are cited.

However, if I wish to be identified by name in this research, I can waive my assurance of anonymity and ask to be identified by name when cited in the research during data collection and dissemination.

Please only check and initial **ONE** of the following boxes:

I wish to be kept anonymous in the data collection and dissemination

Initials: _____

I wish to be identified by name and cited in the research during data collection and dissemination

Initials: _____

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Data Retention: Data collected in the notes, recording and transcript of my interview will be kept in a locked cabinet in the secure office of Professor Eileen O'Connor. The transcript of my interview will be used only for research purposes and retained for a period of 10 years after the end of the research project. After the retention period of 10 years, the documents and audio recordings will be securely destroyed. All data will be kept on password protected goggle docs account.

Voluntary Participation: My participation in research is voluntary and unpaid. I am free to withdraw at any time, and refuse to answer any questions without any negative consequences. If I choose to withdraw from the study, data collected thus far will be securely destroyed.

Acceptance: I, _____, agree to participate in the above research study conducted by *Alyssa Ashton* of the School of Human Kinetics, Faculty of Health Sciences, University of Ottawa, *under the supervision of Dr. Eileen O'Connor*, Associate Professor in Human Kinetics at the University of Ottawa.

If I have any questions about the study, I may contact the researcher or her supervisor at the coordinates provided in this consent form.

If I have any questions regarding the ethical conduct of this study, I may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 154, Ottawa, ON K1N 6N5.

Email: ethics@uottawa.ca

There are two copies of the consent form, one of which is mine to keep. Please sign and return a signed copy of this consent form. Please return to Alyssa Ashton or by mail to Professor Eileen O'Connor, School of Human Kinetics, 125 University Avenue, University of Ottawa, Ottawa, ON K1N 6N4

Signature of research participant:

Name of Participant

Signature

Date

Signature of researcher:

Name of Researcher

Signature of Researcher

Date

Signature of Thesis supervisor:

Name of Thesis supervisor

Signature of Thesis supervisor

Date

APPENDIX B



INFORMATION SHEET FOR POTENTIAL PARTICIPANTS

Dear potential participant,

We are contacting you to participate in our study at the University of Ottawa entitled *Contextualizing the Development and Practice of Aquatic Physical Therapy in Ontario, Canada*.

This study seeks to gain a better understanding of how the field of Aquatic Physical Therapy has developed in Canada, and its current state of training, practice and management. We will look to e-mail you a survey to complete in order to gain insight on current curriculum and knowledge on Aquatic Physical Therapy within your program of Physical Therapy.

Your participation will provide an important voice and insight into the development and current state of Aquatic Physical Therapy across Canada. Your feedback allows us to identify gaps in knowledge and practice with the goal to enhance discussion on providing Aquatic Physical Therapy in Canada.

If you choose to participate, we will e-mail you a consent form that is to be returned through e-mail or mail, along with the survey itself which consists of five (5) questions and will take approximately 30 minutes to complete. The survey will be sent to you in Spring/Summer 2017, and all data and information provided will be stored in a secure location that is password protected through Google docs.

If you wish to participate in this study, please respond to this e-mail and we will respond with further information as well as a consent form.

If you have any questions about this research study, please feel free to contact us through e-mail or phone us.

Thank you,

Alyssa Ashton, MA Candidate

Université d'Ottawa / University of Ottawa

Eileen O'Connor, PhD
Professeure agrégée / Associate Professor
École des sciences de l'activité physique / School of Human Kinetics
Faculté des sciences de la santé / Faculty of Health Sciences

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APPENDIX C

Interview guide

Contextualizing the Development and Practice of Aquatic Physical Therapy in Ontario, Canada

Thank you very much _____ for taking your time to speak with me this morning. Just a quick reminder, I am looking to focus on the training and educational aspects of APT in Ontario, as well as its current state and direction for improvement regarding implementation, qualifications and regulation.

I will take a moment to summarize the consent form that was attached to the original recruitment e-mail. Your verbal consent will be sufficient for the completion of the interview, but I will need a signed copy afterwards. Your participation will consist of an interview regarding questions on your knowledge on aquatic physical therapy. It will be tape recorded and transcribed verbatim then the transcript will be sent back to you for confirmation of responses. You have the choice to be identified throughout my dissertation or I can use a pseudonym to protect your identity. All of the information you provide today will remain strictly confidential and will be used for this dissertation only. Do you have any questions regarding anything I just mentioned? Do you consent to the above conditions? Would you like a pseudonym or to be identified? Test recording device.

Thank you very much I can now begin.

To start I would like to know a bit more about yourself, what is your professional title and what does your position consist of?

What is your training, education, certification regarding APT?

What service do you provide?

What training and education do you provide individuals within the field of rehab?

Who is eligible for the training and what do they do to show their level of education?

What title are they enabled to use after completing your training? What can they advertise as a service to the public? Which terms are they legally allowed to identify themselves as after your training?

Is there anything different about the training for physiotherapists versus others within the field?

Are there other known programs and educational tools for those in rehabilitation to become comfortable in the aquatic environment and practice in the water in Canada that you know of?

- How do you perceive aquatic physical therapy's place within the field of rehabilitation?
 - o In what situations do you see APT implemented and how often do you see it utilized effectively?
 - o How did you and your patients recovering through APT modalities?
 - o Do you believe that APT is fulfilling its purpose within rehabilitation?

Do you train patients as an APT?

How do your patients hear of your services?

How often do these patients possess a doctor's note? How do they know their condition will benefit from APT?

Do patients ask about education of their instructors?

Are patients able to bill through their insurance companies for your services?

What is the most common barriers to participation? *Slip and fall concerns, Body image, Access to the pool?*

What are facilitators for those utilizing the services? What makes them want to come back? Warm water, healing benefits?

Where do you provide your services? Private clinic, community pools? For those looking to practice that do not have access to the same facilities as you do, is the challenging to practice in the water, how does that work are they able to rent our space in a pool? Is there any liability with the location in which the service is provided, or is that completely on the therapist?

- Do practitioners need specific certifications or training to perform APT? (*Lifeguarding skills? regulated through a college? Certification? Certain ability of swimming themselves?*)
 - o Are recertification's necessary?
 - o What programs are in place for physiotherapists to specialize in APT?
- What do you see for the future of APT as a form of rehabilitation in the future in Ontario?
 - o What changes in APT do you see as necessary for the advancement of the field?

APPENDIX D

File Number: H02-17-10

Date (mm/dd/yyyy): 05/26/2017



Université d'Ottawa **University of Ottawa**
 Bureau d'éthique et d'intégrité de la recherche Office of Research Ethics and Integrity

Certificate of Ethics Approval**Health Sciences and Science REB****Principal Investigator / Supervisor / Co-investigator(s) / Student(s)**

<u>First Name</u>	<u>Last Name</u>	<u>Affiliation</u>	<u>Role</u>
Eileen	O'Connor	Health Sciences / Human Kinetics	Supervisor
Alyssa	Ashton	Health Sciences / Human Kinetics	Student Researcher

File Number: H02-17-10

Type of Project: Master's Thesis

Title: Contextualizing the Development and Practice of Aquatic Physical Therapy in Canada

Approval Date (mm/dd/yyyy)

Expiry Date (mm/dd/yyyy)

05/26/2017

05/25/2018

Special Conditions / Comments:

N/A