PROYECTO FIN DE MÁSTER

SERIE: ACTIVIDAD FISICA Y DEPORTIVA

QIGONG AS AN ACTIVE RECOVERY EXERCISE FOR POST-SOCCER MATCH ACTIVE RECOVERY TRAINING SESSIONS.

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Madrid, 2016

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Máster en Entrenamiento y Nutrición de la Escuela de Estudios Universitarios del Real Madrid

Facultad de Ciencias de la Actividad Física y el Deporte

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Madrid 2016

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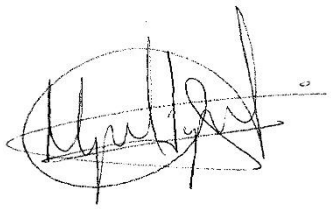
Por la presente,

EL PROFESOR DR. D. MIGUEL ÁNGEL GOMEZ RUANO CERTIFICA:

que el Trabajo Fin de Máster Universitario de Entrenamiento y Nutrición Deportiva titulado “QIGONG AS AN ACTIVE RECOVERY EXERCISE FOR POST-SOCCER MATCH ACTIVE RECOVERY TRAINING SESSIONS.” que presenta D. Anthony Bruce Hazelwood Orellana al superior juicio del Tribunal que designe la Universidad Europea de Madrid, ha sido realizado bajo mi dirección durante el año académico 2015-2016.

Así, por la presente, siempre y cuando así lo considere el citado Tribunal, solicito que sea APTO para su defensa.



Fdo. Miguel Ángel Gómez Ruano

TABLE OF CONTENT

1. ABSTRACT.

The presented document serves as a dual descriptive research paper concerning the study and investigation of soccer match exhaustions, post-match recovery methods, and Qigong training. Initially, the study of fatigue and match rehabilitation, as an aid for post-game weariness, is described. Progressively the analysis of Qigong practices with its proposed healing benefits is investigated.

The outcome of the presented text is to suggest a proposal between Qigong and its use as an active recovery method within the context of soccer. The proposal would unify Qigong practices as an aid to help a soccer squad and its players recover from post-match exhaustions. The suggested implementation of the recovery session would be anywhere from the initial to 48-hour post-match period inside the scheduled micro-week training.

From the obtained conclusions, a proposed Qigong activity plan for an active rehabilitation session is offered. Additionally, future study proposals on the subject matters are suggested.

Key Words: Qigong, Soccer, Fatigue, Active Recovery, Injury, Periodization, Post-Match.

2. OBJECTIVES.

The overall purpose of the Final Master Project was to develop a descriptive narrative review to investigate the topics of soccer specific fatigues, recovery interventions, and Qigong training. Furthermore, the proposal of Qigong exercises as an active recovery method for post-soccer match exhaustions is established.

Therefore, the following objectives are presented:

- **i.** Examine and understand the types of fatigues induced by a soccer match, along with its recovery applications.
- **ii.** Describe and comprehend the purpose, the scheduling period and the application of an active recovery session.
- **iii.** Understand, define, and obtain a general knowledge of Qi and Qigong training.
- **iv.** Examine Qigong and its healing effects on different types of human ailments.
- **v.** Propose ideas of investigation to evaluate the effectiveness of said Qigong program.
- **vi.** Develop a Qigong intervention activity for an active recovery session within the initial to 48-hour post-soccer match timeframe.

3. METHODOLOGY.

The applied methodology in the creation of the present document was achieved in a descriptive research manner. The examined information was attained through scientific works, found via Google Scholar and PubMed, written within the past 12-year timeframe. Minimal usage of professional books, from well know authors and publishers as an investigational tool was applied, where applicable. Furthermore, printing dates of said texts were written between the ten to the twenty-year timeframe.

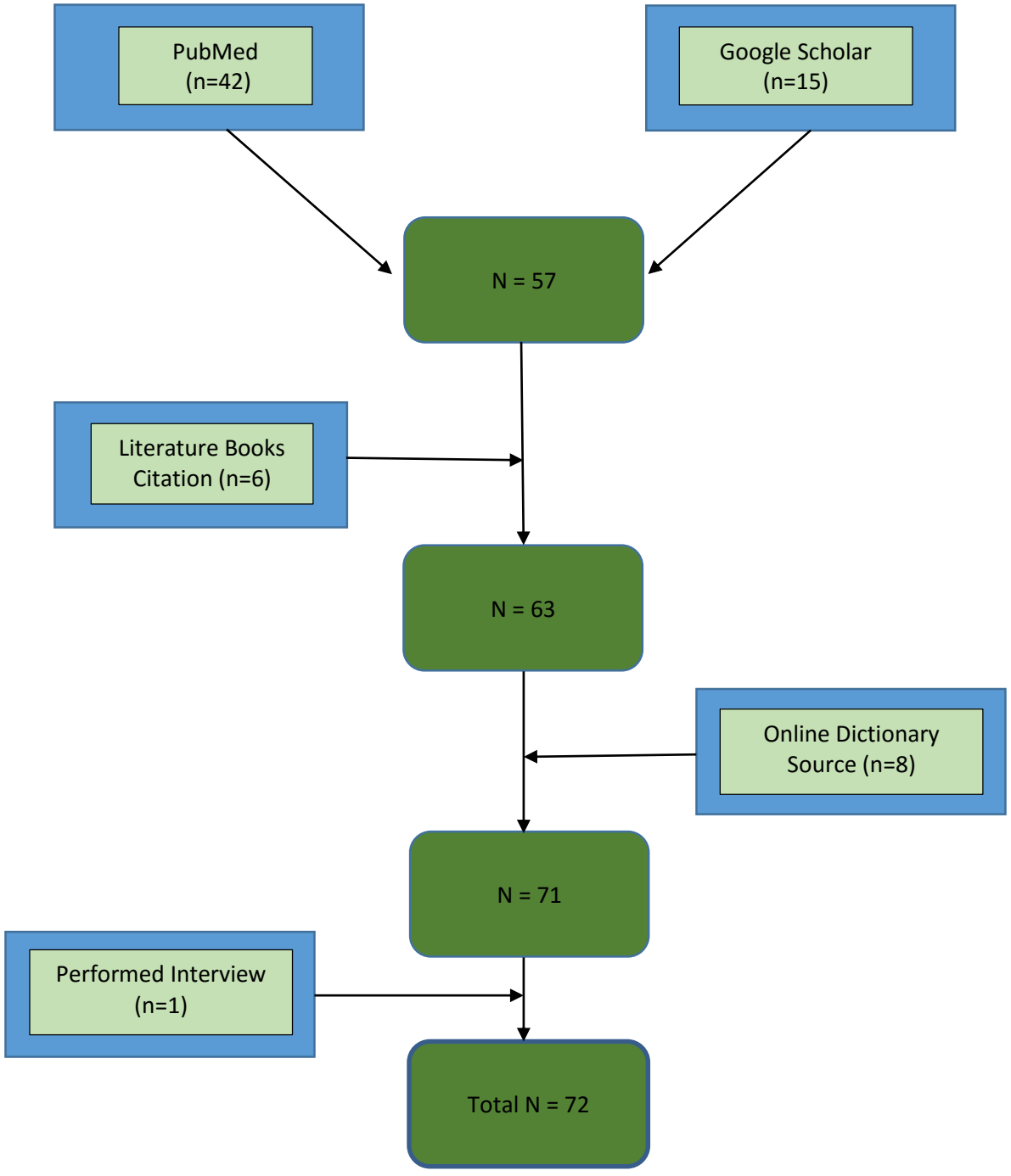
- Selection Criteria:
  - Relevant to the topics.
  - Respected books from well-known authors in accordance to the topics.

- Exclusion Criteria:
  - Topic strays from the documents objectives.
  - Articles in Chinese without translation.

The Applied Search Strategy used through the following equations:

“Fatigue” and “Active Recovery”/ “Fatigue” and “Passive Recovery”/ “Active Recovery” and “Passive Recovery”/ “Soccer” and “Fatigue”/ “Qigong” and “Fatigue”/ “Qigong” and “Recovery”/ “Qi” and “Healing”

Figure 1. Article Table Summary Included in the Research.



4. INTRODUCTION: SOCCER FATIGUE AND RECOVERY.

Understanding the causes of fatigue, during and after a soccer match, is of substantial concern for any sporting organization. Coherent knowledge of the soccer specific weariness, induced on a team, will properly assist in the procedure of alleviating exhaustion. With appropriate recovery methods, the health state of a sporting lineup looks to become predictably optimized for future training and competitive performances. The opening segment of the present paper examines the source of fatigue, specific to soccer, and the types of effects it produces during and after a match. With the examined information, the text looks to define and describe recovery, its types, and intervention purposes to lessen the soccer-specific tiredness observed in soccer athletes. Furthermore, the endeavorment to define and describe active rehabilitation, along with its skeptical effects as a recuperation technique throughout a 48-hour post-match timeframe, is recognized.

4.1. SOCCER FATIGUE: DURING AND POST-MATCH.

Fatigue is defined as a “lassitude or weariness resulting from either bodily or mental exertion” and “that which causes weariness; fatiguing labor, ‘trouble’ (obs.); a fatiguing duty or performance, labor” (Oxford University Press, 2016). As such, soccer athletes will encounter various types of physiological (Romagnoli et al., 2015) and neuromuscular (Rampinini et al., 2011) fatigues during a soccer match. These game induced exhaustions will undoubtingly transfer after a competition, at different ranges of

degree, and present itself as a foreseeable or unpredictable scenario within a team's ecosystem. The predictable and unpredictable mentioned scenarios will lead to the disruption of its homeostasis and further present unexpected complex lassitude issues upon the soccer entity and its mechanisms (Nédélec et al., 2012). Ultimately, these foreknown or unanticipated post-competition circumstances are meant to be dealt with by a soccer team's coaching staff (Boresson & Lambert, 2009). Progressively, the training staff, in their right, attempt to convert said randomness and disorder within the system, known as entropy and defined as a "lack of order or predictability; gradual decline into disorder" (Oxford University Press, 2016) into predictability and order through effective recovery methods. As noted by Tamarit (2012, págs. 25-27), quoting Carvalhal (2001), "unpredictability, instability and randomness of a soccer match makes it a highly complex multifactorial structure."

The game of soccer is comprised of various physiological fitness components, branded by persistent corporal exertion movements such as jumping, shifting of directions, cyclic and acyclic sprinting, running speed variations, and others. It also consists of a technical component involving functional movements such as dribbling, passing the ball, shooting, and others (Nédélec et al., 2012). The previous mentioned physical and technical sport specific movements, performed in a competitive match, ultimately leads to physiological fatigues, such as glycogen depletion, oxidative stress, dehydration and muscle damages, to name a few (Bangsbo, Krustrup, & Iaia, 2007). Furthermore, the grade of said residual physiological weaknesses are comprised by the overall external, e.g.

weather, and the internal, e.g. athletes body mass composition, factors leading to the creation of said post-match tiredness (Rebelo et al., 2012). Additionally, the cognitive and emotional perceptions of an athlete must be taken into account as a cognitive decline experienced by the team, and its components will appear during match play. These mentioned exhaustions will lead to a decrease in the appropriate tactical and technical decision-making applications (Badin, Smith, Conte, & Coutts, 2016). Moreover, said weariness will present a cognitive-emotional fatiguing element to the mentioned entities (Brink, Visscher, Coutts, & Lemmink, 2012).

4.2. RECOVERY: DEFINITION AND CHARACTERISTICS.

A soccer match is physically characterized by recurrent rounds of intermittent-sprint movements, where significant repeated runs are separated by phases of less intense actions (Carling, Bloomfield, Nelsen, & Reilly, 2008). Therefore, as formerly mentioned, a soccer competition causes high physical (Andersson, 2010), neuromuscular (Andersson, Raastad, Nilsson, & Paulsen, 2008) and perceptual (MClean, Petrucelli, & Coyle, 2012) exhaustions on the athletes (Minett & Duffield, 2014). Consequently, understanding the nature of proper recovery procedures, within the previously mentioned stressors, is of outstanding importance for proper rehabilitation interventions and outcomes (Reilly & Williams, 2005).

The act of recovery, defined as, “the regaining or restoration of one's

health or a mental state" (Oxford University Press, 2016) is noted to be categorized in three modes (Bishop, Jones, & Woods, 2008):

i. Immediate recovery between physical actions.
ii. A short-term recovery between repeats or at the end of a session (e.g., between activity intervals, a warm-down, hydrotherapy, nutrition, and others).
iii. A training recovery method or session between workouts or a competitive timeframe. (e.g., 48-hour post-match training session).

Consequently, the post-game recovery procedure begins the moment a team or an athlete finalizes the competitive bout. The residual post-game fatiguing effects are known to be progressively visible within the first 72-hours and perhaps observed up to the 96-hour post-competition mark (Dupont et al., 2010). As noted by Pol (2015) citing Andersson (2010), the first 46 to 48-hour post-match window appears to be an ample and sufficient time for soccer players to recover physically, up to a certain degree. As specified in an additional study, both creatine kinase and delayed muscle onset of muscle soreness (DOMS) remained elevated in athletes throughout the 48-hour post-game timeframe (Fatouros et al., 2010). The identified information further indicates in authenticating the concept of scheduling and implementing an active recovery session within this 48-hour timeframe. Nonetheless, the purpose of a soccer performance recovery plan is to have a favorable role in benefiting the unique non-linear situations presented during and after a competition. As

such, the notion of significant mental-emotional exhaustions existing after a soccer game, for up to at least 72-hours, will be reliant on the number of sprints, rigid changes of direction, real-time cognitive and perceptual experiences encountered during the competition (Nedelec et al., 2014). Therefore, the appropriate planning of a rehabilitation gathering must always take into account the unique individualized physical and mental-emotional weariness the team and its mechanisms are experiencing from the competition (Oliveira, Amieiro, Resende, & Barreto, 2011).

Progressively, when analyzing fatigue within the physical and mental-emotional parameters, the mental-emotional aspect may take a longer period to recover than its physiological partner. As stated by Mourinho quoted by Gateiro (2006), in the book by Tamarit (2012, p. 95), which specifies, “experience tells me that three days after a game players are still not completely recovered. Not so much in physical terms, but fundamentally, in emotional terms. The emotional fatigue takes more time to recover than the physical”.

Although logic and experience will likely dictate the importance of the human mental-emotional recovery aspects, present information stating the effects of a soccer game, its nature as a lengthy intermittent-sprint exercise and the recovery of the central nervous system (CNS) in soccer athletes remains uncertain. Consequently, it is constantly important to take into account the contribution of the central nervous system and its role in the motor unit recruitment process of the athletes. Such role of the CNS should be of particular importance for the construction of a post-

match recovery plan (Minett & Duffield, 2014), along with its noted acquired post-match psychological-emotional fatiguing factors, to obtain maximal benefits and results (Halson, 2014).

4.3. POST-MATCH RECOVERY: ACTIVE VS. PASSIVE.

Intervention is defined as “the action taken to improve a situation” (Oxford University Press, 2016). The post-match recovery intervention, performed by the training staff, has the intent to aid and accommodate such post-match fatigue scenarios. In due course, the aim from those in charge is to speed the athletes recovery process (Gianotti, Hume, & Tunstall, 2010). Thus, it may be stated that the principality of cause and effect breathes throughout the soccer season. The random appearances of circumstances, for both the players and the coaches, with their planned and unplanned interventions, becomes a ripple effect creating the outcome of unforeseen future scenarios (Couceiro et al., 2014). Ultimately, the professional attempt is to produce positive recovery effects from a productive cause, in association with the principle of causality defined as, “the relationship between cause and effect” and “the principle that everything has a cause” (Oxford University Press, 2016). The overall goal of the intervention process would have the effect of the industrious cause attempt to resonate with the regeneration objectives of the organization. As such, these forms of recovery come in many methods and has the purpose in regenerating the fatigue received from the previously performed stresses. Finally, the goal is to prepare the athletes for the immediate and distant future competitive loads and efforts (Nédélec et al., 2013).

To further analyze recovery, its nature can be dual and distinguished as active, “characterized by action” (Dorland's Medical Dictionary, 2016) and passive being defined as, “not active, submissive” (Farlex Partner Medical Dictionary, 2016). Both selves of recovery contain many studies of contrasts and their usages placed by a sporting association, may be deemed as effective when scheduled and applied suitably (Wahl, Mathes, Achtzehn, Bloch, & Mester, 2014).

Passive recovery is widely comprehended as a period of non-training by a team and its players. Such recovery is considered as time off and inactive rest from an exercise action or interval (Jouglaa, Micallefa, & Motteta, 2010) and commonly used in between the transition of training activities (Kellmann, 2010). It is also understood as a day off from a training session or competition (Hausswirth et al., 2011). However, the proposal of identifying passive recovery as either passively recuperating from an exercise or an activity and passively recuperating from a competition should be presented (Bishop, Jones, & Woods, 2008). When passively recuperating from an activity, exercise or a training session, its proposal in falling in line within the definition of still being active should be specified. The proposal of the suggested concept may appear valid since the team, and its constitutes are experiencing real time five-sensory soccer specific materials within the soccer specific environment. Therefore, the implementation of a passive recovery period within a training session should be suggested as being called an actively passive period. Said suggestion is offered, since the various real-time variables a team is experiencing are being lived within the context of the soccer-specific

environment, when either resting with, e.g. jogging, or without, e.g. water breaks, movement.

When passively resting outside of the training session or competition, it may be seen as being an opportune period in having the entity completely rest from the sporting environment. The principal aim would be to apply said restoration procedures to enhance the overall state of the human body. Said regeneration method is accomplished by having a squad and its mechanisms completely rest by becoming inactive, such as with sleep (Nédélec et al., 2015), and absent from the overall sporting training context. Therefore, both the physical and the mental-emotional elements received from the passive rest recovery method is of great benefit for the rejuvenation process of the team and its players (Nédélec et al., 2012).

Active recovery is understood as performing an exercise or session to artificially recover and to renew the sporting entity. Thus, the goal of said recuperation is to enhance the regeneration process at the physical, neuromuscular, and perceptual human levels (Minett & Duffield, 2014). The characteristics of an active recovery exercise or session should include exercise routines where training loads include submaximal work (Pol, 2015). These active recovery exercises are typically performed, as previously stated, after an exercise activity, e.g. the warm-down session, or as the essence of a training session, e.g. session performed the day after or before a competition. Therefore, the active recovery method can be applied as a recuperation technique, executed at any moment, where the intention is to recover the competitors from the previous encountered

loads and stresses. Furthermore, it is typically executed within the following days or the day before a competition (Le Meur & Hausswirth, 2013); (Tamarit, 2012).

4.4. THE POST-MATCH RECOVERY TRAINING SESSION: THE 48-HOUR TIMEFRAME.

To categorize, the moments a coaching staff chooses an intervention point, to artificially accelerate the recovery process, within the initial to 48-hour post-match period, is widely deemed as an active recovery method within an active session. In contrast, as previously stated, when athletes are not involved and are away from the sporting environment, it is known as a passive recovery period.

In respects to active recovery, there are three recognized moments in accomplishing said training session during a micro-week period, within the initial to 48-hour post-match window (Gomez Piqueras, 2015).

Post-Match Active Recovery Sessions:

i. Immediately after the match (Suzuki et al., 2004).
ii. 22 to 24-hours after the game (Lane & Wenger, 2004); (Forsythe, 2015).
iii. 46-48-hours post-soccer match (Elias, Wyckelsma, Varley, McKenna, & Aughey, 2013).

At present, the joint inquiry by many soccer coaches is when to perform an active recovery training session within the immediate to the two-day post-match timeframe. Current scientific evidence and literature do not give way to an absolute concept or results in which moment is superior in implementing a training routine. However, as mentioned by Gomez Piqueras (2015, p. 255) and Pol (2015, pág. 169), the moments an active training session is selected, will ultimately be chosen by the head coach and the coaching staff. Additionally, the many dictated variables when scheduling and performing an active regeneration session (stage of the season, the overall emotional state of the team, the outcome of the previous match, training variables, and others) gives the topic of game recovery a title of a large complex discussion (Nédélec et al., 2012).

Therefore, performing an active recovery training session, within the three mentioned moments (Gomez Piqueras, 2015, p. 255), will consist of having a team and its components be in the context of the organizational ecosystem, e.g. training ground, exercise room (Tamarit, 2012). This periodized timeframe should be cohesively planned and properly executed by the coaching staff, with full awareness, organized intuitiveness and complete understanding of the wants and needs of the team (Boresson & Lambert, 2009). Furthermore, the consideration of all the predicted and unforeseen post event circumstances (Couceiro et al., 2014) should be taken into account to apply this type of recovery session. Therefore, one of the important intentions of an active recovery practice is to regenerate the competitors successfully for future training and competitive load scenarios (Nédélec et al., 2013).

4.5. THE ACTIVE RECOVERY SESSION: SKEPTICAL EFFECTS.

Current active recovery practices in scientific soccer studies have revealed that sessions between the immediate and 48-hour period window do not necessarily improve physical performance nor accelerate biochemical signs of recovery within the athletes (Andersson, Raastad, Nilsson, & Paulsen, 2008). Furthermore, as noted by Pol (2015, pág. 169) citing the study of Andersson (Andersson, 2010), no differences in the markers of oxidative stress, the antioxidant system, neuromuscular recoveries and inflammatory responses were found when comparing groups performing an active recovery session to the group performing a passive recovery regime in the same immediate to 72-hour timeframe.

5. INTRODUCTION: QIGONG.

Qigong is a meditative movement exercise used to heal the many grades of at diseased populations. Its practices are used to promote well-being within the physical and mental-emotional human levels (Langhorst, Klose, Dobos, Bernardy, & Häuser, 2012). Its exercises consist of many different corporal movements and positions, with a significant focus on breathing patterns while remaining in a clear/calm state of mind to induce deep states of relaxation (Larkey, Jahnke, Etnier, & Gonzalez, 2009). Through the research outcomes of the scientific Qigong investigations and its training relatives (e.g. Taichi), we look to discuss and complete the purpose of the document by proposing the concept of Qigong as an active recovery method for post-soccer match regeneration.

5.1. QIGONG: DEFINITION AND CHARACTERISTICS.

According to the author Dr. Yang, Jwing-Ming, Qi is defined as the energy or natural force, the source of life, which fills our universe. It is commonly used to express the energy state of something, mostly with living things and defined as any energy, which can demonstrate degrees of power and strength such as electricity, magnetism, heat, and light. Collectively, the definition of Qi can signify the representation of the energy itself or express the state of the energy. Furthermore, the author defines the art of studying and training of Qi as Qigong, since “Gong” is used in China instead of “Gongfu”, essentially meaning time and energy, giving way to the training known as Qigong, the time, and energy of Qi practice (Jwing-Ming, 1997).

Qigong is categorized as a dynamic meditative movement exercise, extending its existence to a period of more than 4,000 years ago. As previously mentioned by Larkey et al. (2009) it is considered as a form of movement or body position with a foundational focus on breathing, to incur a clear state of mind for deep relaxation purposes. Qigong practices, along with its current scientific studies, is noted in having many physiological and cognitive-emotional effects (Matos, Sousa, Gonçalves, Gabriel, & Greten, 2015). It is deemed as a safe practice consisting of low impact and moderate-intensity type of aerobic exercises, with few reported adverse events (Birdee, Wayne, Davis, Phillips, & Yeh, 2009). Moreover, its usage is deemed suitable for various populations in respects to their age, gender and health status (Abbott & Lavretsky, 2013).

5.2. RESULTS AND DISCUSSIONS: QIGONG TRAINING EFFECTS ON THE HUMAN INSTRUMENT.

Various reviews and studies on the physical benefits of Qigong and its sub-branches, such as Taichi, are reported to produce positive effects on various human systems. Its research on said benefits are growing, and its outcomes include the improvement of the human skeletal system, the cardiovascular system, the mental-emotional human conditions and many others. In addition to the performed Qigong investigations for this document, a brief Q&A e-mail interview was also conducted with Brian Trzarskos (See Appendix I), founder and director of the Institute for Rehabilitative Qigong and Tai Chi, referred to by Tom Rogers, President of the Qigong Institute. Mr. Trzarskos further broadened the effectiveness of

Qi and its training by stating, “Qigong increases flexibility, tendon strength, circulation, body awareness, balance, total body neuromuscular efficiency, and mental focus.” (Trzarskos, 2016).

5.2.1. QIGONG AND BONE DENSITY.

At the skeletal bone density level, a systematic research performed by Weia et al. (2015), demonstrates how Qigong-Wuqinxi training has a positive effect on primary osteoporosis within humans. Improvements from the training program were shown in the bone mineral density (BMD) of the lumbar spine, when in comparison with anti-osteoporosis medications. Additional, improvements in the femoral BMD and the GLA protein of the bone was also observed when combining Qigong-Wuqinxi training with anti-osteoporosis medications. Moreover, pain improvement scores were improved with the Qigong-Wuqinxi training, with or without the presence of anti-osteoporosis medications (Weia, Xub, Yinc, & Zhang, 2015).

In post-menopausal women, a study examined whether a more simplified version of Taichi had a greater effect in the deceleration of bone loss when in contrast to a more traditional Taichi type of training (Qin et al., 2002). The study included 119 postmenopausal women, ages between 52–65 years. The subjects were randomly assigned to either partake in a Taichi Traditional Yang Style Tai Chi program (TTC), a basic Taichi resistance exercise program (TCRT) or a blank control group (BCG) performing monotonous routine activities. Results demonstrated the lumbar bone

mass density in L2–L4 thickness being significantly lower at twelve months when comparing the baseline figures in the BCG. In both the TCRT and TTC groups, the L2–L4 density was comparable to those of the baseline figures, and there was a tendency for bone loss to decrease with the TCRT group when compared to the TTC group. Similar results were also observed with the femoral neck and Ward's triangle of said patients. Final results concluded that the TCRT method may slow bone loss in menopausal women, and is suggested to have superior effects in comparison to a more traditional Tai Chi type of training (Huiru, Bo, Wenhua, Yingzhi, & Dinghai, 2015).

Additionally, a bone experimental design study including a 12-week Qigong-Baduanjin (QD) training program, aiming to prevent bone loss in middle-aged women, was conducted by Chen et al. (Chen, Yeh, & Lee, 2006). The results demonstrated significant differences in Interleukin-6 (IL-6) and bone mineral density (BMD) between the experimental group (EG) and the none intervention groups. As such, final results displayed QD training as decreasing IL-6 and maintained BMD in the EG demonstrating a likely effectiveness in avoiding bone loss. Additional results showed that QD training had value in the promotion and maintenance of well-being within the subjects (Chen, Yeh, & Lee, 2006).

Furthermore, in a preliminary, single-blind, randomized controlled trial in older populations, diagnosed with knee osteoarthritis in Korea (n=44), an improvement in the quality of life and physical musculoskeletal functioning, such as walking, was demonstrated apparently due to Qigong

training (Lee et al., 2009).

Therefore, Qigong and its relatives have the proven scientific data to suggest that it aids with decreasing BMD levels and helps with ailments such as osteoporosis, osteoarthritis, and knee osteoarthritis. Consequently, Qigong practices may contribute in aiding the regeneration process in athletes suffering from minor and major skeletal sports injuries, such as bone fractures.

Table 1. Principle Research Articles of Qigong/Tai Chi and the Bones.

References	Types of Study	Sample	Type of Work	Results
Chen, Yeh, & Lee, (2006)	Experimental	Middle Aged Women	Assignment of an experimental group (n=44) and control group (n=43). The experimental group received a 12-week Qigong-Baduanjin training program, the control group did not.	* Significant differences in IL-6 and BMD between the groups. * Qigong - Baduanjin reduced IL-6 and maintained BMD in the experimental group. * Demonstrates promising efficacy in preventing bone loss commonly occurring in middle-aged women. * Valuable promoting and maintaining the health status of middle-aged women.
An, et. al., 2008	Experimental	Twenty-eight (28) female patients.	Female Patients randomized into the Baduanjin group (n=14) and the control group (n=14). Eleven (11) patients in the Baduanjin group and 10 patients in the control group completed the trial. 30-minute classes five times a week for 8 weeks, whereas the control group received no treatment.	* Compared to the control group, the Qigong-Baduanjin group demostrated: * Reduced pain and stiffness function. * Improved physical function. * Improved aerobic capacity, 6-minute walk test, and peak torque of quadriceps, isokinetic strength of the knee extensors.
Weia, et. al., 2015	Review	Patients with Osteoporosis	Review aims to assess the effect of Qigong-Wuqinxi exercise for primary osteoporosis. Literature search was conducted on the seven databases until June 2015.	* Qigong-Wuqinxi significantly improved lumbar spine bone mineral density compared with antiosteoporosis medications. * Wuqinxi plus antiosteoporosis medications had a better effect on femora bone mineral density. * Additionally, the results showed a remarkable effect in improving pain score when Wuqinxi. * Improvement identified in Qigong-Wuqinxi plus antiosteoporosis medications on bone gla protein.
Lee, et. al., 2009	A preliminary, single-blind, randomized controlled trial.	Older person with knee OA in Korea, N = 44	Qigong (60 min/session × 2 sessions/week × 8 weeks)	* Training group had statistically significant improvements in the quality of life and 6-m walking test: change in walking time. * Tai Chi-Qigong training appears to have beneficial effects in terms of the quality of life and physical functioning of elderly subjects with knee osteoarthritis.

5.2.2. QIGONG AND THE CARDIOVASCULAR.

Available studies suggest that Qigong and Taichi exercises may have advantageous properties in assisting individuals with cardiovascular risk factors and conditions (Yeh, Wang, Wayne, & Phillips, 2009). Two of the known leading causes of heart disease are an inactive lifestyle and stress, with Qigong being noted as a possible effective method for the prevention of cardiovascular diseases (Hartley et al., 2015). Furthermore, studies demonstrate that it may assist in reducing blood pressure as it is one of the most consistent findings throughout various studies (Jahnke, Larkey, Rogers, Etnier, & Lin, 2010).

A Qigong experiment was conducted with persons diagnosed with various mixtures of physical and mental impairments in long-term care housings. The study involved the implementation of a seated Qigong training program and hypothesized that a single Qigong training session would lower blood pressure and increase the quality of life in said individuals. Results demonstrated that a session of seated Qigong elicits a hypotensive response and supports the idea that recurrent Qigong training may provide valuable health benefits, such as lowering blood pressure, within the patients (Freemana et al., 2014). Additionally, in a 12-week Qigong training quasi-experimental study, seventy-seven participants (experimental group (EG) = 47; control group (CG) = 30) were recruited to record if any effects on the heart would appear. The experimental group (EG) performed thirty minutes of an eight-form moving meditation exercise for three times a week, for a total of twelve weeks. The control group (CG) continued their

normal daily activities. After the completion of the 12-week study, results indicated that in comparison with the CG, the EG showed significant heart rate variability improvements and peripheral vasomotor responses (Chang, 2015).

Jones, Dean, and Scudds (2005) conducted an earlier study to investigate the beneficial physiologic effects of Taichi, a branch of Qigong, with a Cheng 119 style program. The training was performed with a novice group (NG) of Taichi practitioners and was taught by an experienced Taichi instructor. The program was implemented for a total of 12 weeks, at three times per week and for 1.5 hours each session. The major findings of the study showed that the Taichi program did, in fact, have an effect on the NG. Results demonstrated augmentations in handgrip strength, elasticity, and greater expiratory flow rate, along with lower blood pressure levels being presented in the individuals (Jones, Dean, & Scudds, 2005).

Table 2. Principle Research Articles of Qigong/Tai Chi and Cardiovascular.

References	Types of Study	Sample	Type of Work	Results
Yeh, Wang, Wayne, & Phillips, (2009)	Systematic Review	Patients w/ cardiovascular disease (CVD) or with cardiovascular risk factors (CVRF).	Evaluating tai chi exercise as an intervention for patients with cardiovascular disease (CVD) or with cardiovascular risk factors (CVRF).	* Initial evidence suggests that tai-chi exercise may be a beneficial adjunctive therapy for some patients with CVD and CVRF. Further research is needed.
Hartley, et al., (2015).	Review	At risk or present CVD individuals.	Various Search in databases to determine the effectiveness of qigong for the primary prevention of CVD.	* Reductions in systolic blood pressure (SBP) and diastolic blood pressure (DBP) were seen in three and two trials, respectively. * Three trials examined the effects of qigong on blood lipids when favourable effects were seen in one trial for total cholesterol, low-density lipoprotein (LDL) cholesterol and triglycerides, and two trials showed favourable effects on high-density lipoprotein (HDL) cholesterol.
Jahnke, Larkey, Rogers, Etnier, & and Lin (2010).	Review	Various	Outcomes related to Qigong and Tai Chi practice were identified and evaluated.	* Seventy-seven articles met the inclusion criteria. * Research has demonstrated consistent, significant results for a number of health benefits in Randomized control trials, including cardiovascular. *Evidencing progress toward recognizing the similarity and equivalence of Qigong and Tai Chi.
Jones, Dean and Scudds (2005)	Experimental	Community in Hong Kong	Beneficial physiologic effects of Tai Chi when performed under stringent experimental conditions can be generalized to the community.	* The novice group had increased handgrip strength, flexibility, and peak expiratory flow rate. * The experienced group had greater flexibility, lower resting heart rate but higher diastolic blood pressure than the novice group prior to training. * A community-based Tai Chi program produces beneficial effects comparable to those reported from experimental laboratory trials of Tai Chi; therefore, it should be considered as a public health strategy.

5.2.3. QIGONG EFFECTS ON THE MENTAL-EMOTIONAL LEVEL.

Stress is defined as “a state of mental or emotional strain or tension resulting from adverse or very demanding circumstances; something that causes mental strain.”(Oxford University Press, 2016). Stress, as a direct outcome of perceptual, social integration and various communal establishments, is known to induce increased rates of physical and psychological ailments (Johansson, Hassmen, & Jouper, 2011). Numerous studies on Qigong and its training relatives have given concrete evidence on how it has or may reduce different types of psychological stress disorders in humans within the various environments (Wang et al., 2014). A study performed in Sweden demonstrates how a scheduled Qigong session, within a school setting in pupils aged 13-14 years old, is a possible way to improve their well-being. Results demonstrated a reduction in psychological distress, stress, and self-image improvement in the Qigong group compared to the control group, where no changes were found (Terjestam, Jouper, & Johansson, 2010).

Within the same line, Hwang et al. (2013) performed a randomized trial intervention using a Qigong-based stress reduction program on distressed Korean population individuals. The outcome of the study appeared to be effective in reducing stress perceptions, anxiety, anger and quality of life improvements in the participating subjects. The benefits and results of the experiment in respects to the Qigong intervention group, when in comparison with the control group, displayed a significant overall decrease in perceived stress scale, state anxiety, trait anxiety and personality

subscale symptoms scores of the Hwa-Byung scale. Also, a high score increase in the World Health Organization Quality of Life Abbreviated version was documented (Hwang et al., 2013).

Chronic fatigue (CF) and chronic fatigue syndrome (CFS) presently affects many individuals in modern society. The persons living with these ailments often experience greater pain and inferior quality of life compared to those that are healthier (NG, Chan, & Ho, 2013). Balancing therapies, such as Qigong training, are often used by patients diagnosed with CF and CFS and has the intention to heal said fatiguing symptoms. Ho et al. (2012), completed a study aiming to assess the effects of a four-month Qigong intervention training program with subjects dealing with CF and CFS. A total of sixty-four participants were randomly assigned to either an intervention group or a waiting list control group. The outcomes displayed that symptoms of fatigue and mental functioning were improved in the Qigong group compared to the control group. The results concluded that Qigong exercise may be deemed as a useful alternative, balancing or rehabilitative training program for individuals suffering from CF and CFS (Ho et al., 2012).

In an additional study performed by Ho et al. (2012), Qigong is noted in being extensively considered as a means to achieve overall health and prolonged existence. To endorse the study, a random controlled trial (RCT) was conducted, which recorded the long-term effects of a qigong training program and its effects on human fatigue, health function, and telomerase activity, known to be an anti-aging biomarker. The trial was compromised of 137 individuals with CFS, with 72 of them participating in the Qigong training

group (QTG) and 65 placed within a white list control group. The intervention included a twice a week, two-hour session for five weeks total, with a Qigong instructor providing the training. Results exhibited that the baseline fatigue numbers were significantly improved in the Qigong group than in the control group. Furthermore, the groups showed no difference in physical functioning changes, but the QTG did show greater improvements in mental functioning than with the control group. Final results demonstrated that Qigong exercises may help reduce fatigue, can have an improvement in long-term mental health operation and has an anti-aging effect on CFS patients (Ho et al., 2012).

Further investigating into the mental-emotional aspect, the psychosocial elements of an athlete may lead to an increasing rate of anxiety and discontent. Such scenarios may be experienced in sports related fields, e.g. dealing with a difficult loss or falling out with a teammate. Consequently, Qigong training as a mind-body therapy exercise is noted to enhance mood and reduce anxiety. Such meditative movement exercises are commonly labeled as having a positive effect on an individual's psychological well-being. To validate, in a study conducted by Johansson et al. (2011), 59 average Qigong practitioners (mean age of 50.8 years) were randomized to either a Qigong group (QTG) or a Control group (CG). Scores in POMS-depression, anger, fatigue, and in the STAI-State anxiety scores were reduced expressively in the QTG but not in the CG. Results concluded that Qigong can produce beneficial psychological effects and help aid in the psychosocial stressors experienced in the many social scenarios (Johansson, Hassmen, & Jouper, 2011).

Table 3. Principle Research Articles: Qigong/Taichi - Mental/Emotional.

References	Types of Study	Sample	Type of Work	Results
Terjestam, Jouper, & Johansson, (2010).	Experimental	Swedish pupils aged 13 to 14 years old	Self-reported well-being at school, psychologic distress, self-image, and stress were measured pre- and postintervention.	* Improve well-being. * Control group reduced well-being at school during the semester and the qigong group was stable. * Qigong group reduced psychologic distress and stress, and had a tendency to improve self-image, whereas no changes were found in the control group.
Hwang et. al., (2013)	Experimental	Korean Population Group	Fifty eligible participants were randomized into two groups, . Qigong-based stress reduction program (BQSRP) or a wait-list control group.	* BQSRP intervention group displayed significantly larger decreases in Perceived Stress Scale scores ($p = 0.0006$), State Anxiety scores ($p = 0.0028$), Trait Anxiety scores ($p < 0.0001$), personality subscale scores of the Hwa-Byung Scale ($p = 0.0321$), symptoms scores of the Hwa-Byung Scale ($p = 0.0196$), and a significantly larger increase in World Health Organization Quality of Life Abbreviated version scores (p s < .05). * The BQSRP appears to be effective in reducing stress perception, anxiety, anger, and improving quality of life.
Ho et. al, (2012)	Randomized Controlled Trial	Patients with chronic fatigue or chronic fatigue syndrome.	Sixty-four participants were randomly assigned to either an intervention group or a wait list control group.	* Fatigue symptoms and mental functioning were significantly improved in the qigong group compared to control group. * Qigong exercise may be used as an alternative and complementary therapy or rehabilitative program for chronic fatigue and chronic fatigue syndrome.
Ho et. al, (2012)	Randomized Controlled Trial	137 CFS patients	Conducted on 137 CFS patients with 72 patients in Qigong group and 65 in wait list control group.	*Baseline (T0) to 3-month post-intervention (T2): Change of fatigue was significantly greater in Qigong group than in control group (-16.1 ± 10.8, and -6.8 ± 8.2, $p <0.001$). *Both groups did not differ significantly in the change of physical functioning (4.4 ± 7.4 and 3.2 ± 6.6, $p=0.373$); but Qigong group showed greater improvement than control group in mental functioning (8.2 ± 11.7 and 1.2 ± 9.5, $p=0.001$). * Conclusion: Qigong exercise helps reduce fatigue and improve mental health functioning in long term and also has anti-aging effect on CFS patients.
(Johansson, Hassmen, & Jouper, 2011).	Randomized Controlled Trial	Fifty-nine regular qigong exercisers (mean age 50.8 years)	Individuals randomized to a Qigong or Control group. Pre- and postmeasurements were then compared.	* POMS-Depression, Anger, and Fatigue, and STAI-State Anxiety scores decreased significantly in the Qigong group but not in the Control group. *Results thereby suggest that qigong exercise can produce desirable psychological effects, and Qigong exercise may therefore be included among other activities performed to boost resistance to daily stressors.

5.2.4. QIGONG EFFECTS WITHIN ADDITIONAL AREAS.

Hsu et al. (2008) performed a study to assess the properties of Baduanjin-Qigong exercises on oxidative stresses, antioxidant status and the quality of life in middle-aged women. The study gathered 31 middle-aged women and was performed in a quasi-experimental design. The subjects completed an administered and standardized Baduanjin-Qigong exercise program. The training program was conducted three times a week for a total of twelve weeks. Results demonstrated significant improvements in quality of life and greater improvements in bodily functions, corporal discomfort, public functions and general mental well-being after completing the exercise program. The final outcomes specifically demonstrated that Baduanjin-Qigong exercises had beneficial effects on improving the quality of living, increasements of antioxidant enzymes and reducing oxidative stress on the performed subjects (Hsu, Wang, Lu, & Lu, 2008).

A single-blinded randomized controlled trial conducted by Chan et al. (2011) evaluated the effectiveness of a Taichi-Qigong (TCQ) program on breathing function improvements and activity leniency in subjects with chronic obstructive pulmonary disease (COPD). In total, 206 COPD subjects were randomly allocated into three groups: The TCQ, the exercise, and the control group. Data collection was recorded at the baseline, the six-week, and the three-month marks. Final results noted improvements in the TCQ group and no changes in the exercise group, while a decline in lung functions was noticed in the control group. The study concluded that TCQ was able to improve respiratory functions and activity tolerance level in COPD clients.

Also, the breathing and walking exercises assisted in preserving lung functions and also slowed disease progressions (Chan, Lee, Suen, & Tam, 2011).

In a systematic review and meta-analyses made by Zeng et al. (2014), five databases (Medline, CINAHL, Scopus, Cochrane Library, and CAJ Full-text Database) were investigated until June 30, 2013. The review and analysis found that Qigong and Taichi training had positive effects on the cancer-specific fatiguing symptoms, immune functions and cortisol levels in cancer patients. However, the findings called for caution, due to the limited number of studies identified and the high risk of bias. Additional demanding trials are needed to explore possible healing effects of said training on cancer patients (Zeng, Luo, Xie, Huang, & Cheng, 2014).

Table 4. Principle Research Articles: Qigong within Other Ailments.

References	Types of Study	Sample	Type of Work	Results
Mei-Chi Hsu et al. (2008)	Quasi-Expiremental Design	31 Middle-Aged Women	The subjects completed an administered and standardized Baduanjin exercise program performed three times a week for a total of twelve weeks.	* Results showed that significant improvements in quality of life and greater improvements in bodily function, corporal discomfort, public function and general mental well-being. * The results specifically demonstrated that Baduanjin-qigong exercises have beneficial effects on improving the quality of living, antioxidant enzyme increase and reducing oxidative stress on the performed subjects.
Chan et. al, (2011)	A single-blind, randomized controlled trial	206 Subjects with chronic obstructive pulmonary disease	Subjects were randomly allocated into three groups: The TCQ, the exercise, and the control group.	* The study concluded that TCQ was able to improve respiratory functions and activity tolerance level in COPD clients. * The breathing and walking workout assisted to preserve lung functions and also slowed disease progression
Zeng et al. (2014)	Systematic Review	Cancer Patients	Five databases (Medline, CINAHL, Scopus, Cochrane Library, and CAJ Full-text Database) were investigated until June 30, 2013.	* The study found that qigong/tai chi training had positive effects on the cancer-specific fatigues, immune functions and cortisol levels of cancer patients.

6. DISCUSSION AND CONCLUSIONS.

A soccer competition induces considerable physiological (Romagnoli et al., 2015) and mental-emotional (Brink, Visscher, Coutts, & Lemmink, 2012) fatigues on a team and its constitutes. The numerous predictable and unpredictable variables of a competitive game will give way to the many unforeseen scenarios within the ecosystem of a soccer squad (Couceiro et al., 2014). These mentioned fatiguing factors will involve the players internal, and the experienced external variables lived and received during a soccer competition (Rebelo et al., 2012). Therefore, a very accurate benchmark of the strenuous influences from a competitive bout may be analyzed by the many advanced types of technology. However, its usage as a match predictor will never be complete since the many unpredictable scenarios with its random and unforeseen outcomes will be present. Thus, the grade of the previously mentioned exhaustions is noted to be a unique and highly complex topic. Therefore, knowledge of the implementation of sports recovery is essential for proper team and player regeneration outcomes (Nédélec et al., 2013).

As such, it is noted that recognizing the causes of fatigue, induced by a soccer match, is substantial for an accurate implementation of a recovery session and imperative for successful team recuperation results. Moreover, understanding fatigue and its facilitation process are necessary for future athletic performances. Thus, an active recovery training session, within the initial to 48-hour post-match period, is also recognized as a multifaceted and non-linear subject matter (Nédélec et al., 2012).

Knowledge of the game of soccer, the understanding of its overall fatiguing effects and the periodization of an appropriate recovery training session, is of high significance when aiming to create an efficient post-match rehabilitation training protocol. Accordingly, it is determined that three notable moments exist when applying an active recovery session (Gomez Piqueras, 2015): i) immediately after a game (Suzuki et al., 2004); ii) 24-hours (Lane & Wenger, 2004); (Forsythe, 2015), or iii) 48-hours post-competition (Elias, Wyckelsma, Varley, McKenna, & Aughey, 2013). Whichever intervention period for regeneration is selected, the essence of said training must consist of exercises and activities with submaximal loads (Pol, 2015). The concept of choosing activities with submaximal capacity labors is preferred, because of the grade of the residual fatigues and the recovery time needed for the execution of future training and competitive performances (Dupont et al., 2010). Therefore, the proposal of Qigong training, as an active recovery method for soccer specific recovery sessions, demonstrates its proposal as a useful and energetic tool in assisting with the human physical and mental-emotional post-match fatigues.

Qigong, along with its training relatives, is known to be an ancient form of meditative movement, consisting of deep breathing patterns, low impact movements and a clearance of mind (Larkey, Jahnke, Etnier, & Gonzalez, 2009). It is established that its usage may revitalize, heal and regenerate the many ailments existing within the various individuals (Langhorst, Klose, Dobos, Bernardy, & Häuser, 2012). Its practices may also have a positive rehabilitative effect on sport and soccer athletes when injured and fatigued.

In regards to the investigated physiological literature, it is recognized that Qigong practices may act as a useful tool in aiding with the reduction of oxidative stresses and the promotion of antioxidant growth, as seen in the study conducted by Hsu et al. (2008). Therefore, with results from the previously mentioned study, a proposal is presented which may state that Qigong practices may have an effect on the oxidative stress levels and in the antioxidant growth levels of the athletes inside the initial to 48 to 96-hour post-match timeframe. The proposal would contrast previous soccer specific active recovery studies conducted by Anderson (2010) and Anderson et al. (2008), where other types of active recovery methods were performed. Both presented studies showed no effects on levels of oxidative stresses and antioxidant counts on soccer players (Andersson, 2010); (Andersson, Raastad, Nilsson, & Paulsen, 2008). Moreover, the studies on Qigong practices and its related training forms establish concrete data that its usage has the potential to aid the skeletal and cardiovascular ailments, along with other different types of human physiological weaknesses and diseases, such as cardiopulmonary diseases.

What is more, where both topics of Qigong and active rehabilitation may converge is on the mental-emotional human plane. Consequently, the demonstrated investigated Qigong data strongly indicates that its training may aid the exhaustive human aspects which are produced by a competitive bout at the mental-emotional human level. Inside the initial to the 48-hour post-match period, it is concluded that a soccer team will experience various types of mental-emotional fatigues. Along with its scientific data, it is observed to have the potential to alleviate such mental-

emotional stressors of anxiety, depression, stress, quality of living, irritation, fatigue, and others (Hwang et al., 2013).

Preliminary proposals on Qigong and its training relatives, in regards to remedying sports induced exhaustions and soccer injuries, should further be presented. Therefore, to observe if Qigong has a recovery effect on soccer players, within the initial to the 96-hour post-match timeframe, additional studies need to be conducted. The additional studies need to record the physiological effects of Qigong practices on soccer specific fatigues, which are encountered in the post-game timeframe. For upcoming proposals, it would be beneficial to suggest studies that are soccer-player specific within various competitive levels and genders. Additionally, it would also be favorable to recommend the conduction of Qigong studies for other sports and sports injury subject matters.

Thus, with the presently available data, we may conclude that Qigong and its training relatives may be a highly effective tool in the regeneration post-soccer match process within the physical and mental-emotional fatiguing elements of the human athlete/instrument. The exhaustions experienced throughout the training week, within the competitive games and the general soccer season, may be remedied by said training when Qigong is proposed as an active recovery method, within the initial to 48-hour post-match timeframe.

➢ To conclude:

- A soccer match causes a high physical and mental-emotional fatiguing element to the teams and its mechanisms.

- An active recovery soccer training session, within the initial to 48-hour post-match timeframe, may be performed within the i) immediate ii) 24-hour and iii) 48-hour period.

- Chosen activities for the active recovery session need to consist of submaximal loads and be regenerative in nature since athletes are not entirely physically and mentally-emotionally recovered.

- Scientific studies demonstrate that Qigong and its training relatives have profound effects on many human ailments experienced by a variety of populations.

- The proposal of Qigong training, as an active recovery tool, may be deemed effective in accomplishing the regenerative objectives and may successfully artificially regenerate the physical and mental-emotional fatigues produced by a competitive soccer match.

- Future Qigong studies need to be sport specific.

7. INTERVENTION PROPOSAL.

The process of recovery begins when a soccer player or a team finalizes a competitive match. The timeframe of the initial to 48-hour post-match period gives a coaching staff the ability to perform numerous methods of recovery, e.g., nutrition, massaging, hydrotherapy, and others (Nedelec et al., 2012). These recovery methods support the regeneration process of the body, mind, and human emotional characteristics. The consideration of when to schedule and perform an active recovery session, within the scheduled weekly training session, is commonly implemented immediately after a game or the first to the second day after a match (Gomez Piqueras, 2015; Pol 2015). Therefore, the act of performing an active recovery session will ultimately be decided, scheduled and carried out by the coaching staff (Boresson & Lambert, 2009). Said training staff must take into consideration all the countless predicted and at random variables (Couceiro et al., 2014), e.g., time of the season, results, types of fatigues, internal relationships, and others, to accomplish and reach the established recovery objectives.

Therefore, as a proposed intervention, the suggestion to schedule a soccer active recovery session will be scheduled two days (46-48 hrs.) after a competition. This timeframe would allow ample time for the team and its mechanisms to be in a state of self-reflection and have the human body-mind-emotions triangle be in a process of regeneration. Therefore, the team and its athletes will be in a passive state and away from the organizational environment throughout the first two days of the post-game competition.

In regards to post-soccer match recovery exercises, it is observed that Qigong and its training relatives have the potential to be used as an active recovery method. Such workout is deemed to meet the sub-maximal training load description and is scientifically considered to have various recovery benefits on the human mechanism (Birdee, Wayne, Davis, Phillips, & Yeh, 2009). With its meditative movement exercise characteristics (Larkey, Jahnke, Etnier, & Gonzalez, 2009), Qigong may be used to assist the exhausted soccer player, since its practices are noted to have a healing essence in fatigued entities.

According to Pol (2015), the type of active recovery sessions performed inside the post-match period should consist of frequent stops and pauses. The reason behind this concept is that regeneration will dictate the actual actions carried out in the recovery training session. Thus, the movement durations within the training should allow players to prepare for future training and competitive loads by having a high number of durational pauses. Furthermore, the overall objective of said training should always fall in line with the game model, style of play and principles of play of the team. The practice content should be tailored for team concepts and principles that are in need of training, usually those noticed from the previous match, or in other topics that are in a general need of reinforcement.

Therefore, if proposing Qigong as an active recovery method for post-match training sessions, it is suggested that its performance should not be implemented any more than fifteen to twenty minutes. Moreover, it should be accomplished before the actual soccer-specific session, so that time from

the specific soccer practice is not taken away from the team. Thus, with its scientific studies, Qigong suggests that it may assist in aiding the draining ailments experienced by the athletes, and the overall outcome of using such method would be a positive revitalization factor for all those involved. Thus to conclude, the final suggestion would be to perform an active recovery session within the two-day post-match period of the competitive match and always performed before the practice session itself.

Table 5 displays the suggested periodization of an active recovery session within a weekly microcycle:

Table 5. One Competitive Game within a Week.

Micro-Week	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Type of Daily Activity	Game	Passive Recovery	Active Recovery	Training: Muscle Tension	Training: Resistance	Training: Speed	Active Recovery & Pre - Game Activation	Game
Purpose of Qigong Activity	Qigong Activity: Pre-Activation Exercises	N/A	Qigong Activity: Recovery Exercises	N/A	N/A	N/A	Qigong Activity: Pre-Activitation Exercises	Qigong Activity: Pre-Activation Exercies
Qigong Duration	1 - 5 minutes	N/A	8 - 15 minutes	N/A	N/A	N/A	5 - 10 minutes	1 - 5 minutes

As observed in Table 5, when there is a one-game a week scenario, within a team's micro-week cycle, the active recovery session will be performed

within the 48-hour post-match timeframe. The recommended Qigong exercises implemented on this day will have the purpose to revitalize the team and to activate them for future training and competitive loads.

In contrast, if a team has a two-game scenario in a weekly microcycle period, as seen in Table 6, then the scheduling of the active recovery training gathering is suggested in being implemented two days after the first competitive match and carried out in the following two-three days after the mid-week competition.

Table 6. Two Competitive Games within a Micro-Week.

Micro-Week	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Type of Daily Activity	Game	Passive Recovery	Active Recovery	GAME	Active Recovery	Active Recovery	Active Recovery & Pre-Game Activation	Game
Purpose of Qigong Activity	Qigong Activity: Pre-Activation Exercises	N/A	Qigong Activity: Recovery Exercises	N/A	N/A	Qigong Activity: Recovery Exercises	Qigong Activity: Pre-Activitation Exercises	Qigong Activity: Pre-Activation Exercies
Qigong Duration	1 - 5 minutes	N/A	8 - 15 minutes	N/A	N/A	8-15 minutes	5 - 10 minutes	1 - 5 minutes

It should be noted, however, that the focal goal of the active recovery session, performed the day after the mid-week match, e.g. day Thursday in Table 6, is to have the team exist in an actively passive mode. This active recovery session is an opportune moment to employ activities such as team

meetings, video clip reviews, and minor sub-maximal load activities within the gathering. The notion behind this suggestion would be ideal, since the planning of an active recovery meeting, the day after the mid-week match, may be more beneficial than a passive rest day. This idea may be endorsed since the active recovery session may be utilized as an opportunity to review various team related details and other concepts to prepare the team for the following upcoming match. Accordingly, the suggested type of scheduling and intervention proposals, of the active recovery sessions, were made to keep the proper balances of performance loads throughout the competitive week. As such, the training session, being performed the day before the scheduled game at the end of the week, will be recovering actively in nature. However, on this day, it will have a pre-activation concept taking into account the body-mind-emotion triangle in order to prepare the CNS and body systems for the next day competition. Therefore, loads on this day may suggest movements of quick and intense actions, but with very low durations and pauses as not to over stimulate the athletes. Moreover, the Qigong activity performed on this day, day Friday in Table 6, might consist of different movements that are a bit more intensive than those completed in the previous days.

The following Table 7 is a suggested exercise and activity program example for a Qigong active recovery training session for the recommended 48-hour post-match period. The movements and styles of Qigong are numerous and the activities performed may also be varied. Furthermore, other body movements and stances from other forms of training, such as Taichi or yoga stances, e.g. 5-star pose, may be used. There are various ways to perform

meditative movement exercises and finding exercises is very simple via book literature and the internet. It would be even more beneficial if the activity would be carried out by a professional. However, those that are fitness trainers and physical educators can easily lead the activities with the proper studies. Further into the characteristics of the exercises, Tzsarkos (2016) mentions “for recovery, both breathing and massage practices are necessary to enhance circulation. Deep abdominal breathing and “sending Qi” to target areas is very effective. Also, self-massage such as shaking, gentle kneading, and acupressure are helpful. For actual movement practices, I recommend gestures that are rhythmic and repeatable in nature, once again to promote both blood and lymph flow” (See Appendix I).

As a final suggestion, when performing Qigong exercises or meditative movement practices, the intention given by the individual must be grounded, concentrated and ready. Specific consideration and focus of the hands is also important since it is an essential component in Qigong and other meditative movement practices. Finally, the continuous performance of Qigong may well bring many healing properties to a soccer team and its athletes, as many scientific studies have suggested its validity as a healing and fatiguing recovery tool for the human body-mind-emotion mechanism.

Table 7. Intervention Proposal.

Qigong Session: Post-Match Active Recovery Session	
Session Duration: 15 minutes	
Exercise Description	**Time**
Relax the Body with deep breaths. Posture is erect with arms/hands by the side and eyes begin to close. Progress to Rhythmic Breathing Pattern: Breathe in for 5 seconds - Pause for 5 seconds- Breathe out for 5 seconds - Pause/Hold for 5 seconds. Breathe in and out from the Belly.	2 minutes
Move into the Wu-Chi Position: Body hanging, dropped lower back, shoulders relaxed, straighten the back, feet parallel, all joints bent without tension, Bend the knees at 45 degrees. Hold arms as if embracing a tree with elbows hanging down. Hold position with relaxed eyes and deep breathing. Stay focused and hands open. Hold over the heart.	3 Minutes
In the Wuchi-Position, begin to kindly but firmly hit the body with cupped hands to activate the body and it systems. Hit the shoulders, trapezius, side of the back, chest, belly, quadriceps, hamstrings, calves, feet and behind the lower back. Perform for 20 seconds rest for 10 seconds.	1 Minute
Come back to Wu-Chi position, but with arms and hands to the side and relaxed. Begin Body shaking exercise, where overall body shaking is performed. Perform for 1 minute seconds and rest for 20 seconds.	4 Minutes
Charge the Kidneys & Reel the Iron: Put hands into fists and begin side to side hitting of the kidneys in a rhythmic pattern. Do for 30 seconds, rest for 10 seconds and then move to tighten the arms and reel the arms in a circular forward and under manner for 10 and rest for 10 seconds/repeat.	2 Minutes
Return to Wu-Chi position. Wave the hands calmly in front of the forehead, chest and lower belly area for 30 seconds each. Then finish by pushing the Qi in a push off stance, repeating 5 times. Return to initial position and settle body.	3 Minutes

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9. APPENDIX I

Q&A Online Interview (05/28/2016) with

Brian Trzarkos Founder and Director of the Institute for Rehabilitative Qigong and Taichi.

1) Benefits and advantages of Qigong training and its integration in sports?

"Increased flexibility, tendon strength, circulation, body awareness, balance, total body neuromuscular efficiency, and mental focus. In my experience, Qigong acts as an exceptional moderate intensity training day activity, as well as pre and post training. Also, Qigong / Tai Chi are both excellent offseason activities to help develop and improve neuromotor efficiency. I worked extensively with a young soccer player this past offseason to develop power, speed, and resiliency. Even as the smallest, younger member of his team he has reported a half-second improvement in his 100-meter dash and a significant improvement in vertical leap. Additionally, he notes being better "grounded" and able to shield larger players from the ball. These are all things we've worked on with specific, "sung" training, Tai Chi jumping, and push hands."

2) Can Qigong be used as an active recovery method for post-match soccer fatigue?

"I added a paper below which shows some significance for strength gains in anaerobically trained athletes. There is a small section on the potential for active recovery methods, which I agree most likely would take place through Qigong tendency to mobilize lymph, blood, and immune properties. We have specifically used Qigong as pre-game warm up with significantly positive effect to enhance resiliency and active relaxation."

3) **Do you know of any sports organizations or teams which perform Qigong?**

"I've come across 2. Cal Poly in San Luis Obispo CA, football, soccer, and volleyball & The University of Virginia swim team."

4) **Types of Qigong training for sports use?**

"I believe that all styles of Qigong are beneficial for both physical and sports enhancement, especially for psychological wellness, mental focus, enhanced circulation, etc. I also believe that the muscle-tendon forms are specifically useful for strengthening neuromuscular systems and clearing connective tissue binding."

5) **Anything worth noting on the topic of Qigong and Sports, and if possible in Soccer as active recovery or pre-activation method?**

"While researching, I came across this paper which may be of some interest.

http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=2599&context=theses

Of course, we specialize in body-mind rehabilitation methods in addition to injury prevention. We've worked with several athletic disciplines including soccer, surfing, hiking, biking, rock climbing, paddling, track, and fencing. Our Rehabilitation Qigong & Tai Chi programs are designed to speed active healing and create more efficient neuromuscular patterns during and after recovery."

6) **What type of Qigong specific exercises are recommend to be best beneficial for treating player recovery for a post-soccer match session, typically in a 48-hour timeframe, for a ten to 15-minute Qigong sessions?**

"It is hard to describe specific exercises in an email however for recovery both breathing and massage practices are necessary to enhance circulation. Deep abdominal breathing and "sending Qi" to target areas is very effective. Also, self-massage such as shaking, gentle kneading, and acupressure are helpful. For actual movement practices, I recommend gestures that are rhythmic and repeatable in nature, once again to promote both blood and lymph flow. We use practices that can be done lying down for a complete spinal range of motion and extremity relaxation as well as standing to create a muscle pumping activity."

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