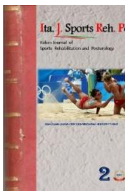

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Clinical and Traditional Rehabilitation Approaches on Injured Football Athletes in Ashanti Region

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Abstract

BACKGROUND: Rehabilitation of traumatic athletic injuries requires modern scientific approaches, the need for comprehensive knowledge of normal and deviance in functional and structural alignments of joints as well as understanding supporting tissues. Complications of injury athletes are attributes of traditional healers' involvement in injury management. Study on clinical and traditional approaches to injury management with specific attention to footballers in Ashanti region is scanty. This study was then undertaken to assess clinical and traditional sports injuries treatment and rehabilitation processes in four football clubs within Ashanti region. It also described knowledge of injury ideology, causes and prevention among football athletes. **METHODS**: Descriptive survey research design was adopted. Judgmental sampling technique was adopted to recruit seventy-five footballers (mean age = 21.89 ± 0.75; mean playing years = 8.63 ± 3.36). Structured and validated four-point-likert scale injury rehabilitation instrument with cronbach's alpha reliability values range 0.82 to 0.90 was employed to collect data. **RESULTS**: Athletes statistically have significant ($p<0.05$) knowledge of general ideology, causes and prevention of injuries. Traditional injury management approaches were statistically significant ($p<0.05$) as against the clinical injury management approaches that were not statistically significant ($p>0.05$). There were significant differences between clinical and traditional approaches to injury rehabilitation $F (24.976) = 29.088$, $p<0.05$). **CONCLUSION**: We conclude that application of sub-standard traditional athletic injury management approaches caused significant degenerative commitment to footballers' performance in the region and that these may undermine the uphill struggle of scientifically inclined sports professionals

Key words: *Herbalists, RICE principle*, *Thermotherapy*, *Cryotherapy*, *Footballers*.

Introduction

Association football is one of the major sports with large audience, attracts investments and enhances healthy exercises across nations (1-2). Football athletes are susceptible to injuries due largely to the physical contact; overtraining and psychological demands for outstanding performance on the field of play (3). Injuries remain as major constraints to effective sports performance in world over (4) including football as with other contact games (3). Many factors, including level of competition, level of exposure, and definition of injury, have resulted in wide variations in the incidence of soccer injuries and have made comparative analysis problematic (2).
Tucker (5) opined that soccer injuries increase in frequency as the age of participant increases, with a low incidence of injury in preadolescent players. He further stressed that musculoskeletal injuries most commonly affect the lower extremities and include contusions, acute and chronic musculotendinous strains, and ligamentous injuries to the knee and ankle. In an attempt to proffer rehabilitating mechanism, Tucker reiterated that most injuries are minor and respond to analgesics, therapy modalities and exercise therapy while groin pain stood as a common problem and particularly prevalent among soccer players owing to the game's specific stresses. Sports injury prevalence in Kumasi includes ankle sprain (20.6%), knee dislocation (20.6%), shoulder dislocation (8.8%), hamstring strain (7.4%), groin injuries (5.9%) and others (22.1%) (6). High injury rates constitute a considerable problem for the player, their families and the community (7). Management of injured footballers requires scientific understanding on biomechanical functioning of the body during and post competition. This is not the case about the sample in this study because injuries were observed to be managed in kumasi with traditional approaches which overemphasize impairment and incorrectly assumed a direct causal link between impairment and disability.
Traditional approaches to injuries rehabilitation are crude and negate professionally scientific methods. In fact, massaging, cryotherapy, thermotherapy, RICE principles and techniques of stretching (8) which aid improvement of articular flexibility recovery and muscle force improvement as well as prevention of injuries, are often neglected. Application of traditional methods has forced many young footballers out of active game prematurely thereafter becoming street beggars who conduce to societal nuisance. The celebrated clinical or modern athletic injury rehabilitation in the advanced world is unpopular among football clubs in Kumasi. Most of the clubs (not all) do not have medical team and where there is, mostly unqualified given room to substandard practices. Thoughtful issue in the present study is the fact that injury rehabilitation through traditional approaches among footballers in Ghana (not in Kumasi alone) has not been well researched and reported to warrant supportively funded corrective scientific research measure into the sports skills thwarted health conditions.

Methodology

Figure 1: Map of the study location

Sample: Ghana is one of the best rated football nations in Africa. One of her best stadium is in Kumasi, the capital of Ashanti region. Ashanti region has 2 premier league and many divisional football clubs with players looking forward to the elite level. Simple random sampling technique was used to select one premier league club and three clubs from others. The seventy five athletes recruited for the descriptive survey study were sampled through judgmental sampling technique. Athletes who sustained injury that thwarted ability to perform at all for one or more weeks were majorly recruited.

Instrumentation: The instrument used was the structured questionnaire divided into general ideology on injury (six items), knowledge on causes of injury (eleven items), knowledge of injury prevention(fifteen items), clinical approaches to injury management (twenty four items), and traditional herbalist approaches to injury management (thirteen items). The instrument designed to elicit four-point-likert scale responses of strongly agree (SA rated 4), agree (A rated 3), disagree (D rated 2) and strongly disagree (SD rated 1). The question items were standardized in order to precisely characterise observed traditional practices about injury rehabilitations and best clinical practices in advanced world. Professional experts were consulted to ensure content and construct validity of the instrument. Cronbach's alpha reliability test conducted on the instrument yielded values range 0.82 to 0.90. Informed consent obtained from the athletes and cooperation of the club management board was also sought. The athletes were contacted during their training sessions.

Statistical Analysis: Data was entered into Excel for window 7 and exported to statistical package for the Social Sciences (SPSS, Version 17.0; SPSS Inc., Chicago, IL) for analysis. Chi-square test (tables 2-5), multiple partial correlation (Appendix A) and regression analyses (Appendices B - C) carried out to determine relationship between clinical and traditional approaches set at 0.05 level of significance.

Results

The ages of respondents ranged from 15 to 23 years and above. Respondents who fall between the ages of 19-22 years dominated the local terrain more than the other age categories. From the study, 43(57.33%) of respondents had secondary education compared to Junior High School of 13(17.33%), Highest National Diploma 10(13.3%), Diploma 6(8.0%) and 3(4.0%) having Degrees. It was noted that majority of respondents played locally as against the national level with 94.67% and 5.33% respectively. Multivariate correlation (R) and regression (F) tests of between subject effects in Appendices (B - C) revealed the following estimated R squares and Adjusted R squares to show that there are significant differences between clinical and traditional injury rehabilitation approaches of footballers in Kumasi.

a. R Squared = .467 (Adjusted R Squared = .013) b. R Squared = .751 (Adjusted R Squared = .540)
c. R Squared = .661 (Adjusted R Squared = .372) d. R Squared = .797 (Adjusted R Squared = .625)
e. R Squared = .670 (Adjusted R Squared = .389) f. R Squared = .503 (Adjusted R Squared = .080)
g. R Squared = .466 (Adjusted R Squared = .012) h. R Squared = .719 (Adjusted R Squared = .480)
i. R Squared = .686 (Adjusted R Squared = .419) j. R Squared = .653 (Adjusted R Squared = .358)
k. R Squared = .612 (Adjusted R Squared = .281) l. R Squared = .588 (Adjusted R Squared = .238)
m. R Squared = .540 (Adjusted R Squared = .148) n. R Squared = .545 (Adjusted R Squared = .158)
o. R Squared = .710 (Adjusted R Squared = .463) p. R Squared = .715 (Adjusted R Squared = .473)
q. R Squared = .755 (Adjusted R Squared = .547) r. R Squared = .590 (Adjusted R Squared = .242)
s. R Squared = .561 (Adjusted R Squared = .188) t. R Squared = .591 (Adjusted R Squared = .243)
u. R Squared = .595 (Adjusted R Squared = .250) v. R Squared = .524 (Adjusted R Squared = .119)
w. R Squared = .476 (Adjusted R Squared = .031) x. R Squared = .701 (Adjusted R Squared = .447)

Table 1: Symmetric Measures of Age and Level of Play

		Value	Age (yrs)	Highest Level of Play		Total	Pvalue
				Local	National		
Nominal by Nominal	Contingency Coefficient	.042	15-18	24	1	25(33.33%)	.936
Interval by Interval	Pearson's R	.034	19-22	31	2	33(44.00%)	.771[c]
Ordinal by Ordinal	Spearman Correlation	.035	23+	16	1	17(22.67%)	.763[c]
N of Valid Cases		75		71(94.67%)	4(5.33%)	75(100%)	

Asymp. Std. Error[a] = .111, .110, Approx. T[b] = .292, .302 a. Not assuming the null hypothesis. b. Using the asymptotic standard error assuming the null hypothesis. c. Based on normal approximation.

Table 2: Chi-square (X^2) Analysis on General ideology [(A)] and knowledge of Causes [(B)] of Injury of injuries

Items No (A)	1	2	3	4	5	6
Chi-Square	33.640[a]	40.360[a]	53.480[a]	50.387[a]	63.613[a]	57.000[a]
Df	3	3	3	3	3	3
P-value	.000	.000	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5 b. The minimum expected cell frequency is 18.8.

Items No (B)	1	2	3	4	5	6	7	8	9	10	11
Chi-Square	34.160[b]	37.040[b]	26.960[b]	50.813[c]	32.240[b]	63.507[c]	43.453[c]	60.200[c]	26.480[b]	14.440[c]	39.187[c]
Df	2	2	2	3	2	3	3	3	2	3	3
P-value	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.0.
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 18.8.
Analysis in table 2 showed that the athletes have significant general ideology of injury ($p<0.05$) and that they significantly have knowledge of the causes of athletic injuries ($p<0.05$).

Table 3: Chi-square (X^2) Analysis on knowledge of injury prevention

Items No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chi-Square	69.587[a]	67.347[a]	57.427[a]	22.547[a]	49.533[a]	59.027[a]	31.760[b]	.653[c]	35.840[b]	41.040	32.240	35.840	63.933	66.173[a]	18.253[c]
Df	3	3	3	3	3	3	2	1	2	2	2	2	3	3	1
P-value	5.233E-15	1.579E-14	2.084E-12	.000	1.004E-10	9.488E-13	1.269E-07	.419	1.650E-08	1.225E-09	9.981E-08	1.650E-08	8.482E-14	2.814E-14	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 18.8. b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.0. c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.5.

Knowledge of injury prevention is not significant (p>0.05) as seen in tab **Table 4: Chi-square (X^2)**

Analysis on Clinical Approaches

Items No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Chi-Square	37.467[a]	49.747[b]	46.227[b]	16.640[c]	51.667[b]	64.787[b]	9.747[b]	20.307[b]	9.000[b]	10.600[b]	32.147[b]	32.013[d]	26.173[b]	34.640[c]	16.147[b]	14.440[b]	12.520[b]	7.187[b]	55.040[c]	21.160[b]	19.347[b]	12.840[b]	59.347[b]	65.360[c]
Df	4	3	3	2	3	3	3	3	3	3	3	1	3	2	3	3	3	3	2	3	3	3	3	2
P-value	1.321	.000	1.402	.000	.000	.088	1.021	.000	2.059	.014	.000	.083	.073	.000	.101	.002	.126	.066	2.000	.000	.000	.005	2.340	3.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 15.0. b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 18.8. c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.0. d. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.5. Table 4 revealed that most of the items in the clinical approaches to injury rehabilitation were not significant (p>0.05).

Table 5: Chi-square (X^2) Analysis on Traditional Approaches

Items No	1	2	3	4	5	6	7	8	9	10	11	12	13
Chi-Square	23.080[a]	25.853[a]	35.240[a]	15.293[a]	22.867[a]	18.067[a]	64.787[a]	55.080[a]	22.547[a]	12.307[a]	11.213[b]	9.720[b]	14.520[b]
Df	3	3	3	3	3	3	3	3	3	3	1	1	1
P-value	.000	.000	.000	.002	.000	.000	.000	.000	.000	.006	.001	.002	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 18.8.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 37.5.

A look at table 5 revealed that all of the items in the traditional approaches to injury rehabilitation were significant ($p<0.05$).

Discussion

This study assessed clinical and traditional sports injuries treatment and rehabilitation processes in four football clubs within Ashanti region. The knowledge of how the body works is very vital in injury rehabilitation but this becomes worrisome when educational level of sportsmen (footballers) is low as seen in this study. Majority of the respondents confirmed that they know how the body works with a percentage of 45.33% agreeing and 37.33% strongly agreeing. This affirms that genetic composition of the human body plays a major role in the individual body make up and disposition to handle injury. Respondents were asked whether physical contact can cause these kinds of injuries. More than half of the respondents confirmed that physical contact can cause injuries with 34.67% strongly agreeing and 32% also agreeing. The occurrence of injuries and the knowledge in their prevention are mutually inclusive as majority of respondents were aware that some of the injuries are avoidable.

On the statement of how injuries can be prevented, it was brought to the fore that knowing the rules of the game is significant to injury prevention. It was noticed that majority of the respondents knew the rules of the game but those at the national level had more insight about the game because of the national exposure. Generally, there are significant differences between clinical and traditional approaches to injury rehabilitation.

Clinical Approach to Injury Management

The study considered clinical injury management mechanisms such as RICE, cryotherapy, thermotherapy and CPR/AED services. Present study shows that medical team is not in most of the clubs to carry out correct clinical injury management. Those teams without medical teams either sought for help from teams that have or go for nonclinical treatment methods. However, there is significance approach to the use of cryotherapy for controlling inflammation which is in line with clinical practices in injury rehabilitation. This is not unexpected because freeze water or Ice Park of extremely low temperatures (below -100^{o}C) is usually applied to prevent short term relief and further limits swelling by reducing blood flow to the injured. Studies have shown that clinical application of low temperatures is recommended for inflammatory conditions, such as swelling and acute localised pain associated with football injuries (9-12). The study established that some of the athletes have applied one of the RICE principles before but not all which could be the 'I=Ice'. With the absence of medical teams, most teams are not able to provide the necessary logistics and services during critical moments. This is evidence as there are no significant approaches to CPR/AED, thermotherapy and psychotherapy applications.

With these outcomes, early clinical evaluation and diagnosis of injuries will be elusive except victims are referred immediately. Rehabilitation of injured athletes with opportunity for fully early recovery correlates positively with clinical diagnosis (13). Studies affirmed that clinical diagnosis of injured athletes ensures standard direction of management and consequently promotes quick recovery and active maximum sports performance (14-15). In actual practice, the clinical injury rehabilitation and management of injured athletes are based on a critical appraisal of the published literature (16).

Traditional Approach to Injury Management

This study reveals that athletes utilise traditional approaches to injury management. This stems from the fact that 44.0% admitted that most of the traditional herbalists has full knowledge of professional approach to treatment. This supports the fact that those who have no medical team in their clubs visit traditional herbalist any time they sustained injuries. This supports the notion that the traditional care of diseases and afflictions remain popular in African setting despite civilization and the existence of modern health care services (17-18). The reasons for which African or footballers in this regard patronise traditional healer were attributed to cheaper fees, easy accessibility, quick services, cultural belief, utilisation of incantations and concoction, and pressure from friends and families (19). These reasons should not be applauded because the side effects of most traditional injury management approaches lack scientific fact, thereby aggravating injury conditions. Consider situation where traditional healer spits on athletes' opened wound under the disguise of concoction or incantations, virus or germs could be transferred to the athlete with already weak immune system.

All the items under traditional injury management approach examined in this study are significant in practices. The practices are passed on by oral tradition without regulation, review and even peer-criticism (19). The mechanisms or procedures used by herbalist for injury management were compared with the clinical methods used by clubs medical teams. Most of the respondents confirmed that the clinical approach to injury treatment is more effective than the traditional approach to injury treatment. This is a confirmation of indisputable finding that traditional practice is trending in medicine (18, 20). The traditional setting where structured training is lacking will result in unproductive recovery as the practice is associated with so many problems, which include the process of establishment of diagnosis that is shrouded in mystery (21) and a notorious inability to identify cases beyond their ability and consequent non-existence of a referral system (19).

A practice where traditional bonesetters stabilize a limb after splinting and bandaging using stones as well as the used of materials such as plywood, hard cardboard, and tree bark for splinting has been reported (22). These obnoxious practices have attracted diverse complications and untold hardship has been placed upon fateful athletes.

In spite of the accepted benefits of clinical approaches, majority of these footballers still acknowledge superstitious spiritual backing in some sustained injuries and injury recovery in football. The superstitious belief in injury management accompanies the reception of the acts such as spitting on injury or breaking the leg of a chicken as mechanism for injury healing.

The position occupied by and the activities of these traditional healers should be drastically modernized through interventional research study. As a matter of fact, herbalist and traditional healers should be structurally trained to strengthen injury management and recovery processes rather been overlooked.

Conclusion

Footballers admit that injuries are effectively healed by traditional herbal approaches than clinical. Footballers patronise traditional herbalists to recover from injury sustained which would have chronic complications on their future career if neglected. Therefore collaborative work between clinical and traditional practitioners should be instituted. Clinical practitioners should give structured training and formal training on modern and proper management of sports injuries to traditional practitioners.

References

1. Abass AO, Moses MO, Alabi EF, Adedugbe BO, Falola KO, Abayomi AO. Relationships between bio-physiological parameters and speed performance of Nigerian FIFA referees. *Journal of Physical Education and Sports Management,* 2011 November 18; 2(6): 58-61. American Academy of Pediatrics, Injuries in Youth Soccer: A Subject Review**,** 2013. (Accessed February 4, 2015, @ http://pediatrics.aappublications.org/content/105/3/659.full#content-block.)

2. Da-Silva AI, Paes MR, Oliveira MC. Injuries in Soccer (Football) Referees of Santa Catarina State. *Journal of Exercise Physiologyonline,* 2014; 17(5):21-30.

3. Mojtaba EV, Mohammad HA, Mohsen K, Hossienali N, Abdorreza G. Taekwondo Competition Injuries in Iranian Premier League: A Prospective Study. *International Journal of Sport Studies,* 2013; 3 (5): 542 - 548, (Accessed January 17, 2015, @ http: www.ijssjournal.com) ISSN 2251-7502, VictorQuest Publications

4. Tucker AM. Common soccer injuries: Diagnosis, treatment and rehabilitation. *Sports Medicine,* 1997 January; 23(1):21-32 Abstract, PMID:9017857 [PubMed - indexed for MEDLINE] (Accessed February 7, 2015 @ http://www.ncbi.nlm.nih.gov/pubmed/9017857)

5. Adjei JA, Moses MO, Nutakor FK, Gyinaye AJ. Sports injuries and Injury Management Techniques among Domestic Athletes in Kumasi, Ghana. *International Journal of Sports Sciences and Fitness,* 2015 January; 5(1):31- 41

6. Bean T. The Effectiveness of Soccer-Specific Training Programs on Preventing Injuries in Adolescent Soccer Players: An Evidence-Based Review. (Accessed February 5, 2015,@http://ptrehab.ucsf.edu/sites/ptrehab.ucsf.edu/files/documents/The%20Effectiveness%20of%20SoccerSpecific%20Training%20Programs%20on%20Preventing%20Injuries%20in%20Adolescent%20Soccer%20Players_Bean.pdf)

7. Rath JF, Hradil AL, Litke DR, Diller L. Clinical Applications of Problem-Solving Research in Neuropsychological Rehabilitation: Addressing the Subjective Experience of Cognitive Deficits in Outpatients with Acquired Brain Injury. Rehabilitation Psychology, 2011; 56(4): 320–328, American Psychological Association; 0090-5550/11/$12.00 DOI: 10.1037/a0025817.

8. Lubkowska A. Cryotherapy: Physiological Considerations and Applications to Physical Therapy, In Bettany

9. Saltikov J. (Ed.), Physical Therapy Perspectives in the 21st Century - Challenges and Possibilities, 2012; Chapter 7, 155-176 ISBN: 978-953-51-0459-9, InTech, (Accessed January 13, 2015 @ http://www.intechopen.com/books/physical-therapyperspectives-in-the-21st-century-challenges-and-possibilities/cryotherapy-physiological-considerations-andapplications-to-physical-therapy).

10. Stanek A, Cieslar G, Rosmus-Kuczia I, Matyszkiewicz B, Romuk E, Skrzep-Poloczek B, Birkner E, Sieroń A. Influence of whole body cryotherapy on blood morphology parameters in patients with ankylosing spondylitis and in healthy volunteers. *Acta Bio - Optica et Informatica Medica*, 2006; 12(3): 207-210

11. Hopkins JT. Knee Joint Effusion and Cryotherapy Alter Lower Chain Kinetics and Muscle Activity. *Journal of Athletic Training*, 2006; 41(2): 177–184

12. Zagrobelny Z. Local and whole-body cryotherapy. *Elsevier Urban and Partner;* Wrocław 2003.

13. Rothstein, J. Evidence-Based Physical Therapy Practice, In D.V. Jewell (Editor). *Guide to evidence-based physical therapy practice.* Sudbury, MA: Jones and Bartlett Publishers, 2008; Part 1, Chapters 1& 3: 3- 33

14. Myklebust G, Bahr R. Return to play guideline after anterior cruciate ligament surgery. *British Journal of Sports Medicine,* 2005; 39:127-131.

253

15. Meeuwisse WH. Predictability of sports injuries: what is the epidemiological evidence? *Sports Medicine,* 1991; 12:8–15.

16. Gremion G. The effect of stretching on sports performance and the risk of sports injury: A review of the literature. Schweizerische Zeitschrift für «Sportmedizin und Sporttraumatologie», 2005; 53 (1): 6–10

17. Thanni, L.O.A. (2000). Factors influencing patronage of traditional bonesetters. West African Journal of Medicine, 19(3):220–224.

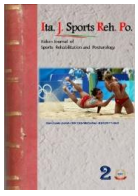
18. Orjioke CJG. Does traditional medicine have a place in Primary Health Care? *Orient J of Medicine*, 1995; 7(1and2):1–3.

19. Dada A, Yinusa W, Giwa S. Review of the practice of traditional bone setting in Nigeria. *African Health Sciences*, 2011; 11(2): 262–265

20. Ebert JR, Fallon M, Zheng MH, Wood DJ, Ackland TR. A randomized trial comparing accelerated and traditional approaches to postoperative weight bearing rehabilitation after matrix-induced autologous chondrocyte implantation: findings at 5 years. *American Journal of Sports Medicine*, 2012; 40(7):1527-1537. doi: 10.1177/0363546512445167. Epub 2012 Apr 26. (Accessed February 8, 2015 @ http://www.ncbi.nlm.nih.gov/pubmed/22539536)

21. Alonge TO, Dongo AE, Nottidge TE, Omololu AB, Ogunlade SO. Traditional bone setters in South Western Nigeria - Friends or Foes? *West African Journal of Medicine,* 2004; 23(1):81–84.

22. Omololu AB, Ogunlade SO, Gopaldasani VK. The practice of traditional bone setting: training algorithm. *Clinical Orthopaedics and Related Research,* 2008 October; 466(10):2392-2398. doi: 10.1007/s11999-008-0371-8.



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APPENDIX A: Multivariate Correlation Analysis

Control Variables			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Traditional Approaches	1	R																								
		Significance (2-tailed)	.																							
		df	0																							
	2	R	.113																							
		Significance (2-tailed)	.388																							
		df	58	0																						
	3	R	.156	.271*																						
		Significance (2-tailed)	.235	.036	.																					
		df	58	58	0																					
	4	R	.044	.432*	.374*																					
		Significance (2-tailed)	.736	.001	.003	.																				
		df	58	58	58	0																				
	5	R	-.019	.041	-.048	-.289*																				
		Significance (2-tailed)	.886	.758	.718	.025	.																			
		df	58	58	58	58	0																			

													.	0
										.	0	.870*	.000	58
								0	753*	000	58	798*	000	58
					0	258*	047	58	343*	007	58	246*	058	58
		0	119	364	58	158	226	58	043	742	58	061	641	58
.199	.127	58	.147	.263	58	.107	.415	58	.148	.260	58	.178	.174	58
-.132	.313	58	.136	.300	58	-.242	.062	58	-.287*	.026	58	-.216	.097	58
.089	.497	58	.192	.142	58	.052	.692	58	.072	.586	58	-.080	.543	58
-.017	.900	58	.198	.130	58	-.151	.249	58	-.050	.704	58	.021	.876	58
-.131	.320	58	.128	.331	58	.069	.602	58	-.023	.859	58	-.026	.846	58
R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df
6			7			8			9			10		

													.	0
										.	0	.035	.793	58
							.	0	.045	.731	58	.109	.407	58
				.	0	.128	.329	58	-.099	.453	58	.130	.322	58
	.	0	.116	.376	58	.165	.207	58	-.156	.234	58	.521	.000	58
.436*	.001	58	.164	.210	58	.365*	.004	58	-.075	.571	58	.512*	.000	58
.481*	.000	58	.278*	.032	58	.356*	.005	58	-.043	.743	58	.544*	.000	58
.396*	.002	58	-.011	.931	58	.247*	.057	58	.056	.670	58	.552*	.000	58
.162	.217	58	.196	.132	58	.299*	.020	58	-.074	.576	58	.112	.393	58
.199	.128	58	-.181	.167	58	.090	.494	58	.102	.439	58	.239	.066	58
.045	.732	58	.028	.832	58	.202	.121	58	-.028	.833	58	-.183	.161	58
-.171	.192	58	-.019	.884	58	-.122	.353	58	-.051	.698	58	-.281*	.029	58
-.048	.717	58	.083	.529	58	.042	.747	58	.339	.008	58	-.062	.637	58
.099	.449	58	.186	.156	58	.121	.356	58	.024	.857	58	-.143	.276	58
-.047	.724	58	.123	.349	58	.097	.462	58	-.079	.547	58	.074	.572	58
R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df
11			12			13			14			15		

													.	0
										.	0	-.087	.509	58
							.	0	.068	.607	58	.595*	.000	58
				.	0	.730*	.000	58	.142	.279	58	.566*	.000	58
	.	0	.421	.001	58	.449*	.000	58	-.147	.263	58	.627*	.000	58
.504*	.000	58	.532*	.000	58	.513*	.000	58	-.039	.769	58	.416*	.001	58
.071	.587	58	-.040	.761	58	-.083	.528	58	-.027	.836	58	.090	.493	58
.180	.168	58	.297*	.021	58	.208	.111	58	.265*	.040	58	.332*	.010	58
.118	.371	58	.234	.072	58	.007	.960	58	.186	.155	58	.237	.068	58
.379*	.003	58	.641*	.000	58	.510*	.000	58	.212	.103	58	.538*	.000	58
.464*	.000	58	.680*	.000	58	.641*	.000	58	.096	.464	58	.601*	.000	58
.488*	.000	58	.730*	.000	58	.573*	.000	58	.054	.682	58	.654*	.000	58
.401*	.001	58	.595*	.000	58	.515*	.000	58	.033	.801	58	.374*	.003	58
.086	.511	58	.217	.095	58	.139	.289	58	.042	.747	58	.166	.204	58
.117	.374	58	.151	.248	58	.258*	.046	58	.021	.871	58	.106	.422	58
.208	.111	58	.211	.106	58	.162	.216	58	.266*	.040	58	.121	.358	58
-.234	.072	58	-.275*	.033	58	-.356*	.005	58	-.163	.213	58	-.128	.329	58
-.146	.267	58	.043	.742	58	-.345*	.007	58	-.098	.458	58	-.030	.818	58
-.071	.589	58	.118	.369	58	.026	.841	58	.054	.681	58	.104	.430	58
-.030	.821	58	.011	.935	58	-.015	.912	58	.164	.212	58	-.166	.205	58

	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df	R	Significance (2-tailed)	df
16				17			18			19			20		

	21	r	.075	.022	-.056	-.119	.286*	219	267*	406*	.365*	.291*	.251	-.060	.154	.039	.360*	.524*	.336*	.384*	.002	.285*				
		Significance (2-tailed)	.571	.866	.670	.365	.027	093	039	001	.004	.024	.053	.647	.241	.765	.005	.000	.009	.002	.987	.027	.			
		df	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	0			
	22	r	-.058	-.145	.016	-.081	.044	201	-.005	302*	.301*	.313*	.171	-.017	.053	.011	.230	.277*	.248	.218	-.094	.263*	.026			
		Significance (2-tailed)	.660	.271	.903	.540	.736	124	972	019	.020	.015	.191	.898	.688	.936	.077	.032	.056	.095	.473	.042	.844	.		
		df	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	0		
	23	r	-.242	-.096	.145	-.079	.149	033	156	362	.573*	.428*	.207	.176	.220	.439*	.216	.375*	.320*	.281*	-.118	.536*	.302*	.246*		
		Significance (2-tailed)	.062	.465	.268	.546	.256	802	233	004	.000	.001	.113	.179	.091	.000	.097	.003	.013	.030	.370	.000	.019	.058	.	
		df	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	0	
	24	r	-.246	-.105	-.336*	-.285*	.323	-.030*	105	149	.286*	.275*	.390	.030*	.181	.114	.142	.389*	.394*	.307*	.119	.411*	.281*	.132	.381*	
		Significance (2-tailed)	.058	.424	.009	.027	.012	818	425	255	.027	.033	.002	.819	.167	.387	.280	.002	.002	.017	.364	.001	.030	.314	.003	
		df	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	

*Correlation is significant at the 0.05 level (2-tailed)

APPENDIX B: MULTIVARIATE REGRESSION ANALYSIS BETWEEN CLINICAL AND TRADITIONAL APPROACHES

Effect		Value	F	df	Pvalue
Intercept	Pillai's Trace	.976	29.088[a]	24	.000
	Wilks' Lambda	.024	29.088[a]	24	.000
	Hotelling's Trace	41.066	29.088[a]	24	.000
	Roy's Largest Root	41.066	29.088[a]	24	.000
Traditional healers are better than Medical team	Pillai's Trace	1.154	1.023	48	.477
	Wilks' Lambda	.172	1.001[a]	48	.506
	Hotelling's Trace	2.926	.975	48	.539
	Roy's Largest Root	1.955	1.466[b]	24	.204
Procedures used by herbalist effective than sports medical team	Pillai's Trace	1.799	1.185	72	.254
	Wilks' Lambda	.042	1.351	72	.128
	Hotelling's Trace	7.251	1.578	72	.048
	Roy's Largest Root	5.375	4.255[b]	24	.001
Herbalists have any professional education	Pillai's Trace	1.597	2.970	48	.000
	Wilks' Lambda	.041	2.806[a]	48	.001
	Hotelling's Trace	7.925	2.642	48	.002
	Roy's Largest Root	4.066	3.050[b]	24	.009
Herbalists have knowledge in athletic injuries	Pillai's Trace	2.222	2.262	72	.001
	Wilks' Lambda	.011	2.499	72	.000
	Hotelling's Trace	12.328	2.682	72	.000
	Roy's Largest Root	7.352	5.820[b]	24	.000
Superstitious beliefs in injury management	Pillai's Trace	2.260	2.416	72	.000
	Wilks' Lambda	.009	2.750	72	.000
	Hotelling's Trace	13.609	2.961	72	.000
	Roy's Largest Root	7.448	5.896[b]	24	.000
Injury recovery having any spiritual backing	Pillai's Trace	2.570	4.734	72	.000
	Wilks' Lambda	.003	4.409	72	.000
	Hotelling's Trace	18.612	4.050	72	.000
	Roy's Largest Root	7.855	6.219[b]	24	.000
Spitting on injuries aids in healing	Pillai's Trace	1.498	2.238	48	.007
	Wilks' Lambda	.062	2.147[a]	48	.011
	Hotelling's Trace	6.157	2.052	48	.017
	Roy's Largest Root	3.700	2.775[b]	24	.015
Is it relevant to break a chicken leg	Pillai's Trace	1.962	1.497	72	.058
	Wilks' Lambda	.034	1.497	72	.064
	Hotelling's Trace	6.816	1.483	72	.075
	Roy's Largest Root	3.809	3.015[b]	24	.008
Healing of injury obtain from Traditional healers	Pillai's Trace	2.117	1.899	72	.006
	Wilks' Lambda	.019	1.982	72	.005
	Hotelling's Trace	9.632	2.096	72	.004
	Roy's Largest Root	6.242	4.942[b]	24	.000

Traditional healers worsen the cases of injuries	Pillai's Trace	2.235	2.314	72	.001
	Wilks' Lambda	.015	2.230	72	.001
	Hotelling's Trace	9.705	2.112	72	.004
	Roy's Largest Root	4.174	3.304[b]	24	.005
Informal trained traditional healers allowed to practice	Pillai's Trace	.802	2.867[a]	24	.014
	Wilks' Lambda	.198	2.867[a]	24	.014
	Hotelling's Trace	4.048	2.867[a]	24	.014
	Roy's Largest Root	4.048	2.867[a]	24	.014
Gifted healers should also have a professional education	Pillai's Trace	.679	1.500[a]	24	.196
	Wilks' Lambda	.321	1.500[a]	24	.196
	Hotelling's Trace	2.118	1.500[a]	24	.196
	Roy's Largest Root	2.118	1.500[a]	24	.196
Formal education better the practices of traditional healers	Pillai's Trace	.857	4.246[a]	24	.002
	Wilks' Lambda	.143	4.246[a]	24	.002
	Hotelling's Trace	5.995	4.246[a]	24	.002
	Roy's Largest Root	5.995	4.246[a]	24	.002

a. Exact statistic b. The statistic is an upper bound on F that yields a lower bound on the significance level.

c. Design: Intercept + Traditional Approaches

APPENDIX C: MULTIVARIATE TEST OF BETWEEN SUBJECT EFFECTS

Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Pvalue
Rice principles	471.508[a]	34	13.868	1.029	.462
Cryotherapy is essential for controlling inflammation	29.898[b]	34	.879	3.557	.104
Ice should not be placed on the skin directly	27.601[c]	34	.812	2.289	.006
Ice should not be placed on the eye	26.048[d]	34	.766	4.630	.000
Ice should not be placed excessively	1179.178[e]	34	34.682	2.385	.004
Medical team knows some of the allergies of players	16.533[f]	34	.486	1.190	.297
Medical team holds the right qualification	34.469[g]	34	1.014	1.027	.464
Injured athletes are monitored and cared for by medical team	40.956[h]	34	1.205	3.006	.100
Massage remedies are given to athletes	48.894[i]	34	1.438	2.570	.102
Medical team applies thermotherapy	44.398[j]	34	1.306	2.213	.108
Vibration therapy given by medical team	39.109[k]	34	1.150	1.852	.031
Club medical team performs surgery if possible	6.322[l]	34	.186	1.681	.058
Medical team able to provide CPR or AED service an emergency	26.517[m]	34	.780	1.379	.164
Referred to a specialist or hospital if possible	13.391[n]	34	.394	1.407	.149
Medical team able to provide correct diagnosis and evaluation	47.346[o]	34	1.393	2.875	.106
Medical team able to provide immediate care	43.696[p]	34	1.285	2.950	.201
Treatment rehabilitation and reconditioning services	53.378[q]	34	1.570	3.632	.000
Medical team promotes high quality healthcare	41.713[r]	34	1.227	1.695	.055
Club has injury insurance policy	9.350[s]	34	.275	1.503	.108
Medical processes and remedies	31.727[t]	34	.933	1.700	.054
Services provided by medical team scientifically proven	37.315[u]	34	1.097	1.726	.049
Medical team provides psychotherapy remedies	33.353[v]	34	.981	1.294	.216
Medical team able to draw a nutritional plan	23.172[w]	34	.682	1.069	.417
Ghana have enough specialist in sport medicine	10.784[x]	34	.317	2.757	.101