Evaluation of Burundi Physical Education Teachers, Coaches, and Athletes' Sport Nutrition, Massage, and Physiotherapeutic Exercises Knowledge

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Received July 6, 2020; Revised August 17, 2020; Accepted August 28, 2020

Cite This Paper in the following Citation Styles

(a): [1] Yustinus Sukarmin, Japhet Ndayisenga , "Evaluation of Burundi Physical Education Teachers, Coaches, and Athletes' Sport Nutrition, Massage, and Physiotherapeutic Exercises Knowledge," *International Journal of Human Movement and Sports Sciences*, Vol. 8, No. 4, pp. 154 - 159, 2020. DOI: 10.13189/saj.2020.080408.

(b): Yustinus Sukarmin, Japhet Ndayisenga (2020). *Evaluation of Burundi Physical Education Teachers, Coaches, and Athletes' Sport Nutrition, Massage, and Physiotherapeutic Exercises Knowledge*. *International Journal of Human Movement and Sports Sciences*, 8(4), 154 - 159. DOI: 10.13189/saj.2020.080408.

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Abstract Knowledge is an important aspect for every person; especially it is very important for physical education teachers, coaches, and athletes. Although the knowledge about nutrition, massage, and physiotherapeutic exercises was investigated in Burundi Country. This study was a descriptive lookup with blended methods. The participants of this lookup were 15 physical education teachers, coaches, and athletes taken by representative sampling. Data evaluation techniques used correlation and linear regression among indicators-variables, and between variables themselves with Software PLS-SEM and SPSS.21. The effects confirmed that there was a low correlation ($r: 0.45$) between the items-global knowledge, and the negative correlation ($r = - 0.068$) was found between prices of Gigabyte (GB) and source of learning confirmed that the more the price of gigabyte was expensive, the more the source of information about the learning was not sufficient. The correlation between nutrition and its indicators was not strong, consecutively presented (base: 0.339; components: 0.355; knowledge: 0.402). The relation between learning (X_1), nutrition (Y_1) { $R_{x_1y_1}: 0.421$ }, and Knowledge (Y_3) { $R_{y_1y_3}$ } was not strong; the subjects have little knowledge about nutrition. The consecutively correlation of indicators (basics: 0.366; massage course: 0.378; knowledge: 0.441), on massage and physiotherapeutic exercises showed that subjects held little knowledge about the previous courses. Knowledge became strong management tools that help

physical education, sport medicine, coaching training managers to decide how to improve peak of performance, to maintain the good quality of athletes and non-athletes: This learn about was the first to apply to evaluate career to the knowledge of physical education teachers, coaches, and athletes.

Keywords Evaluation, Knowledge, Nutrition, Massage, Physiotherapeutic Exercises

1. Introduction

Evaluation is a strong tool to know the level of someone about the material object and formal object. Evaluation is one party from assessment which is used as an instrument before like pre-test during and after (post-test) with its aims to evaluate the process of doing something like: teaching, training, learning...etc. Knowledge is the among the first scientific needs for every person, especially it is very important for Physical Education Teacher, Coach, and athlete [1, 2]. Although the knowledge about nutrition and physiotherapy exercises have been surveyed, this topic still relatively new area in Burundi Country. The questionnaires on determining science knowledge are designed [3], however, the criteria for assessing knowledge have been determined [4].

Therefore, evaluating knowledge in science is a combination of many tools to assess the validity of knowledge [5]. The evaluation is the process of monitoring the ability of subject to obtain the level of information an object material [6]. Massage is a healing method that uses the movements of the hands or tools against soft body tissues. Massage is the art of hand movements that aim to get pleasure and maintain physical health [7]. Massage is a treatment of physical, physiological and psychological aspects for athletes. This can be used before or after sports activities. If used before exercise, it will be very beneficial in elongating and loosening smooth tissue. Massage refers to the systematic manipulation of the body's smooth tissue for therapeutic functions and blood circulation. Massage is the science and artwork of making use of techniques related to maintaining the fitness of athletes and for improving athletic performance [8]. Benefits from rub down are so many: ease muscle tension, enhance blood flow, alleviate pain, promote relaxation, and relieve stress [9]

Exercise Therapy is the science of treating humans with bodily extraordinary needs (or those who can also develop bodily disabilities), to assist them limit and/or maintain simple practical capabilities (e.g., Sitting, standing, walking) and reduce their condition from progressing as a great deal as possible. Exercise Therapy is a routine or layout of physical activities designed and prescribed for precise therapeutic goals. Its cause is to work closer to the restoration of regular musculoskeletal feature or to limit pain above and under the web page of injury brought about by means of diseases or injuries thru neuro reeducation, gait training and therapeutic things to do. The therapy which is done with the help of the exercise aims at the relief of the pains and ensures the development of the motor skills, the muscles of the body, the joints, the flexibility and the balance are developed by the exercises and the daily activities. Living beings with exceptional bodily desires or the capacity for bodily strength are supported by physiotherapists to maximize and maintain health. Training is a very essential way to improve the skills and bio motor capacity of individuals. The essential objectives of physiotherapists and their assistants fall into three categories: (1) they become facilitators and allow the development of their bodily capacities, (2) they try to limit eternal disabilities and help people to improve or improve themselves. adapt to the abilities they have lost and they work with human beings to help them feel less pain.

Occupational therapists assess and treat men and women with illnesses, injuries, cognitive impairments, psychosocial dysfunctions, mental illnesses, developmental disabilities or to acquire knowledge about disabilities, bodily disabilities or different desires or exclusive conditions. Assessment and intervention focus on an individual's function level and include assessment of overall performance areas, performance components and performance contexts. The intervention includes the use of targeted activities to develop, improve, maintain or restore

characteristics in the areas of overall performance, including, but not limited to: daily living skills, job performance, performance skills overall academic and leisure skills. The aim of the exercise remedy is to prevent dysfunctions, develop, correct, restore and maintain [10]: (1) the strength of automobiles; (2) Endurance and cardiovascular fitness; (3) Mobility and flexibility; (4) Stability; (5) Relaxation; (6) Coordination, stability and functional capacities. An athlete's nutritional knowledge, as well as practice, should have an impact on the athlete's overall performance. [11]

For physical education teacher, coach, and athlete is very needed getting enough understanding about nutrition and physiotherapeutic exercises, because we cannot expect performance by ignoring the later keys above. In the country of Burundi many athletes are suffering from malnutrition, during the national competition most of athletes often suffering from musculoskeletal injuries. The level of knowledge about nutrition, massage, and physiotherapeutic exercises for Physical Education Teacher, Coach, and athlete still unknown till now, the reason why the research will conduct a study about Evaluation of Burundi Physical Education Teacher, Coach, and athletes' sport nutrition, and Physiotherapeutic Exercises mechanism. The aims of this research were to determinate the degree of knowing on sport nutrition, massage, and physiotherapeutic exercises, to give up information to the researchers in order to provide the solution to current issue because the good physical body condition of people is one of the most factors which allows human to attend sustainable goals and successful performance during the competition for the athletes.

2. Material and Method Research

2.1. Research Design

This research is a descriptive study with mixed design quantitative and qualitative approaches. It is possible to answer the research questions using a qualitative and quantitative method. The study was a descriptive research which seeks to know the capacity of knowledge of the subject on a problem posed. However, quantitative data is reinforced by qualitative description.

2.2. Research Subject

The sampling of this research was 9 Physical Education Teachers, 4 Physical Education Teachers and Coach, and 2 athletes from Burundi country taken by representative sampling. The whole population were 150 subjects, and 10% of the population has been representative taken. The subjects chosen were able to provide all the necessary information about knowledge in physiotherapy and sport nutrition.

2.3. Research Instrument

Technique collection data with Google form questionnaire and interview. Data were collected using the plate form of google form to reach information while it was hard to meet the subjects in this covid-19 period, however a kind of interview has been conducted to reach more qualitative information.

2.4. Analyze Data

Data analysis technique with correlation between indicators and variables, using PLS SEM and SPSS Amos 23.

The research hope was to evaluate the knowledge of physical education teacher, Coach, and athletes about massage and physiotherapeutic exercises through the below Indicators and variables. This research has three independent variables named in X format: (1) Learning or X1 was independent variable which helped to reach or to evaluate if the subjects have learnt about the topic; (2) learning sources or X2 was also an independent variable which contributed to give knowledge to the participants the more the capacity of access information is high the more the knowledge of the sample is highly in the quality; (3) Gigabyte price or x3 was an independent variable showed how the price contribute as a limited factor in accessing information. Secondly there were three dependent variables: knowledge in nutrition, knowledge in massage and physiotherapeutic exercises, Global knowledge in massage and physiotherapeutic exercises respectively Y1, Y2, and Y3, it was the issue to evaluate the correlation or influence from the independent variables to the dependent variables.

Nevertheless, about the indicators, they were classified or attached according to the dependent and independent variables. So (1) lecturer qualification, and (2) learning programs indicators of Learning independent variable (X1); (3) internet access, (4) pedagogical supports, (5) broadcast media (TV&Radion), (6) sources indicators of learning sources independent variable (X2); (7) gigabyte indicator of Gigabyte price independent variable (X3). The following indicators like (8) basics in nutrition, (9) components of nutrition, and (10) knowledge in nutrition belong to nutrition dependent variable (Y1); (11) basics in massage and physiotherapeutic exercises, (12) massage course, and (13) knowledge in massage and physiotherapeutic exercises were attached to massage and physiotherapeutic exercises dependent variable (Y2); the last dependent variable Global knowledge in massage and physiotherapeutic exercises (Y3) was connected with (14) global knowledge its indicator.

An indicator is a sub-group or an element which helps researcher to know deeply the different variables wherever independent or dependent.

Research Hypothesis were:

1. Correlation was found between indicators and Variable.
2. Relationship was found between established variable and independent variable.

The look up Structural Equation Modeling (figure 1) helped us to locate the correlation that existed between warning signs and variables, and secondly the correlation that existed between variables themselves as the lookup hypotheses established above. This lookup structural equation modeling has constructed with six variables (three structured variables), three unbiased variables, and quatorze indicators.

Figure 1. The Research Structural Equation Modeling

Figure 2. The Research Structural Equation Modeling Result2

3. Result

The result research has been presented and explained. An analyzing of the above figure 2 was done.

The figure 2 showed a positive correlation between qualification of the lecturers, programs taught, and learning, the correlation was consecutively 0.538; 0.514. The previous correlation tested that lecturers have a qualification related with the learning given, but also the programs were coherent with the learning. The strong correlation $r = 0.810$ between indicators (qualification, programs) and learning independent variable indicated the good corresponding between them.

The low correlation obtained between source of learning independent variable (X2) and its indicators (internet access, pedagogical supports, broadcast media (TV&Radion)) consecutively -0.084 ; 0.399 ; 0.386 ; 0.358 , the previously data explained that internet was not very easy to allow the good source of learning, physical education teachers, coaches, and athletes can't access easily internet to get more information about massage and physiotherapeutic exercises. The pedagogical supports used were not consistent or related to massage and physiotherapy. Socio media like video television (TV) and Radio did not broadcast enough information about the material object; this one can be explained by a strong lack of qualified lecturers in massage in physiotherapeutic exercises. The source of information was not corresponding to the massage and physiotherapeutic exercises courses.

The negative correlation ($r = -0.068$) obtained between prices of Gigabyte (GB) and source of learning confirmed that the more the price of gigabyte was expensive the worst

is source of information about the learning. The price of gigabyte was a limiting factor for subject in searching information about massage and physiotherapy. Nevertheless, the negative correlation ($r = -0.046$) between nutrition dependent variable and price of gigabyte showed that the high price did not allow subject to investigate about nutrition.

The subjects have a low knowledge about nutrition, the last statement was confirmed by the low correlation between nutrition dependent variable (Y1) with its indicators as it consecutively presented (base: 0.339; components: 0.355; knowledge: 0.402). The relation between learning (X1), nutrition (Y1) { R_{x1y1} : 0.421}, and Knowledge (Y3) { R_{y1y3} } was not strong. The first correlation between learning and nutrition means that the lectures have a good qualification in other course but little knowledge about nutrition; secondly the capacity about nutrition was not also strong.

There was indirect correlation between learning and global knowledge (R_{x1y3}): 1.560 that value was rejected because was not in interval of $[-1, +1]$. The same on X2 and Y2, there is no directly relation the value was rejected (R_{x1y2} : 1.096)

The low correlation between massage and physiotherapeutic exercises (Y2) and its indicators were indirectly explained by the lack of information sources. The following correlation of indicators (basics: 0.366; massage course: 0.378; knowledge: 0.441), showed that subjects held little knowledge about the previous courses. However physical education teachers, coaches, and athletes held a low level about nutrition, massage, and physiotherapeutic exercises.

Table 1. Correlation between item and global knowledge

Correlation item-total statistics	
Item-total	Corrected Item-Total Correlation
Item-Global Knowledge	.450

With SPSS the correlation between Global Knowledge and Item r: 0.450 was not strong which means that the subjects surveyed were living a lack of knowledge in nutrition, massage and physiotherapeutic exercises.

4. Discussion

The most benefits of this study were evaluation of Burundi Physical Education Teachers, Coaches, and athletes' sport nutrition, massage, and physiotherapeutic exercises knowledge. Evaluation is the series of accessing and interpretation of records about any factor of a software of training or education as part of an identified technique of judging its effectiveness, its efficiency and any other results it may additionally have [12]. The research made evaluation about the knowledge of nutrition, massage, and physiotherapeutic exercises referring to the important of them for every human body athletes and non-athletes. The result showed that the subjects did not have enough knowledge.

The low correlation (r: 0.45) confirmed the previous argument. Even though knowledge in nutrition massage and physiotherapeutic exercises is very grateful there were some limiting factors like internet which was not very easily accessible [13], he found in their research that the high price of gigabyte limited the subjects to be connected on the whole worldwide. The high price of every product decreases the satisfaction and loyalty behavior of the customers. In this study the subjects have insufficient sources of knowledge, lack of pedagogical support contributed negatively on the knowledge. The suite able environment and the good equipment will positively influence the result of learning, knowledge, and increase the productivity in different domains [14].

Massage is a famous therapy preference of athletes, coaches, and sports activities physical therapists. Nevertheless, its purported advantages and everyday use, proof demonstrating its efficacy is scarce, rub down has been promoted as a treatment of preference for several prerequisites such as musculoskeletal injuries, cancer, stress, relaxation, and being pregnant [15]. Physical activity intervention programs have been found to effectively improve physical fitness, strength, and balance [14]. The good knowledge in massage will help coaches, physical education teacher to help their athletes. Centers for Disease Control and Prevention (CDC) defines musculoskeletal disorders as injuries or disorders of the muscles, nerves, tendons, joints, cartilage and supporting structures of the upper and lower limbs, neck, and lower back1. These can be caused or exacerbated by exertion or

prolonged exposure to physical factors [16]. Musculoskeletal disorders and injuries of the upper and lower extremities are common the reason why is a strong need of knowledge of massage for coaches, athletes and physical education teachers. Exercise packages centered towards strengthening the supportive musculature of in many instances injured areas [17]. Treatment is a necessary issue which can have an effect on the result [18]. Nutrition evaluation is a vital first step in advising athletes on dietary techniques that consist of dietary supplementation, and in evaluating the effectiveness of supplementation regimens [19]. Nutrition training objectives to enhance information and improve dietary intake in athletes. Understanding athletes' vitamin knowledge and its effect on dietary intake [20]. Nutrition understanding of an athlete, as well as practice, is predicted to have an effect on athlete's overall performance [11]. The result of the study showed that the subjects have a low-level knowledge in nutrition; this one should affect the performance of athletes in Burundi country not only for athletes but also for every human body. Competitors have dreams to optimize overall performance and to hold healthful physique composition. Sports nutrition is an aspect of coaching packages regularly not noted by means of student-athletes and their coaches [21].

In general, physical education teachers, coaches, and athletes need enough knowledge in nutrition, massage, and physiotherapeutic exercises in other to allow high performance and to maintain the health of athletes and non-athletes.

5. Conclusions

Referring to the effects of the lookup and discussion that have been put forward, conclusions can be drawn: Physical education teachers, coaches, and athletes still need to emphasize deeply the nutrition, massage, and physiotherapeutic exercises in other hop a peak of performance and to improve the quality of human life. The high price of gigabytes and the low level of accessible of internet were the major limiting factor for increasing the knowledge.

Acknowledgements

We strongly thank to the contributors in this lookup who have given a written consent, however additionally our deeply feelings gratitude has been addressed to the physical schooling teachers, coaches, and athletes from Burundi for statistics provided.

Conflict of Interest

No conceivable struggle of hobby was once said through the authors.

REFERENCES

- [1] Heaney, S., O'Connor, H., Michael, S., Gifford, J., & Naughton, G. (2011). Nutrition knowledge in athletes: a systematic review. *International Journal of Sport Nutrition and Exercise Metabolism*, 21, 248-261.
- [2] Carbone E., & Zoellner J. (2012). Nutrition and health literacy: a systematic review to inform nutrition research and practice. *Journal of the Academy of Nutrition and Dietetics*, 112(2), 254-265.
- [3] Trakman, G., Forsyth, A., Hoye, R., & Belski, R. (2018). Development and validation of a brief general and sports nutrition knowledge questionnaire and assessment of athletes' nutrition knowledge. *Journal of the International Society of Sports Nutrition*, 15(17), 1-8.
- [4] Yerzhanova, Y., Sabyrbek, Z., Dilmakhanbetov, E., Madiyeva, G., & Milasius, K. (2019). Evaluation of knowledge and competence of kazakhstani athletes about nutrition. *Sport Mont*, 17(2), 87-91. doi: 10.26773/smj.190615
- [5] Silk, K., Sherry, J., Winn, B., Keesecker, N., & Horodyski, M., et al. (2008) Increasing nutrition literacy: testing the effectiveness of print, web site, and game modalities. *Journal Nutrition Education Behavior*, 40, 3-10.
- [6] Zoellner, J., Connell, C., Bouds, W., Crook, L., & Yadrick, K., (2009). Nutrition literacy status and preferred nutrition communication channels among adults in the Lower Mississippi Delta. *Preventing Chronic Disease*, 6(4), A 128.
- [7] Vuurberg, G., Hoorntje, A., Wink, L. M., van der Doelen, B. F. W., van den Bekerom, M. P., Dekker, R., ... Kerkhoffs, G. M. M. J. (2018). *Diagnosis, treatment and prevention of ankle sprains: update of an evidence-based clinical guideline. British Journal of Sports Medicine*, 52(15), 956–956. doi:10.1136/bjsports-2017-098106
- [8] Standley, R. A., Miller, M. G., & Binkley, H. (2010). *Massage's Effect on Injury, Recovery, and Performance: A Review of Techniques and Treatment Parameters. Strength and Conditioning Journal*, 32(2), 64–67. doi:10.1519/ssc.0b013e3181c33918
- [9] Seman, S., Macura, M., Markovic, B., & Barak, O. (2019). Injury incidence in female serbian elite volleyball players. *Sport Mont*, 17(3), 101-104. doi: 10.26773/smj.191005
- [10] Thompson, W. R., Scott, A., Loghmani, M. T., Ward, S. R., & Warden, S. J. (2015). *Understanding Mechanobiology: Physical Therapists as a Force in Mechanotherapy and Musculoskeletal Regenerative Rehabilitation. Physical Therapy*, 96(4), 560–569. doi:10.2522/ptj.20150224
- [11] Folasire, O. F., Akomolafe, A. A., & Sanusi, R. A. (2015). *Does Nutrition Knowledge and Practice of Athletes Translate to Enhanced Athletic Performance? Cross-Sectional Study Amongst Nigerian Undergraduate Athletes. Global Journal of Health Science*, 7(5). doi:10.5539/gjhs.v7n5p215
- [12] Lacouture, A., Breton, E., Guichard, A., & Ridde, V. (2015). *The concept of mechanism from a realist approach: a scoping review to facilitate its operationalization in public health program evaluation. Implementation Science*, 10(1). doi:10.1186/s13012-015-0345-7
- [13] Ndayisenga, J., Tomoliyus (2019). "Effect of Service Quality and Rates on Satisfaction and Loyalty of Customer Behavior at Fitness." *International Journal of Human Movement and Sports Sciences* 7.2 (2019) 25 - 32. doi: 10.13189/saj.2019.070202
- [14] Ndayisenga, J., & , T. (2019). The perception of international students on the facility and sport tourism event management. *Sport Mont*, 17(2), 53-58. doi: 10.26773/smj.190609
- [15] Samples, P. (1987). *Does "Sports Massage" Have a Role in Sports Medicine? The Physician and Sportsmedicine*, 15(3), 177–183. doi:10.1080/00913847.1987.11709311
- [16] Piper, S., Shearer, H. M., Côté, P., Wong, J. J., Yu, H., Varatharajan, S., ... Taylor-Vaisey, A. L. (2016). *The effectiveness of soft-tissue therapy for the management of musculoskeletal disorders and injuries of the upper and lower extremities: A systematic review by the Ontario Protocol for Traffic Injury management (OPTiMa) collaboration. Manual Therapy*, 21, 18–34. doi:10.1016/j.math.2015.08.011
- [17] Chan, C., & Ackermann, B. (2014). *Evidence-informed physical therapy management of performance-related musculoskeletal disorders in musicians. Frontiers in Psychology*, 5. doi:10.3389/fpsyg.2014.00706
- [18] Jack, K., McLean, S. M., Moffett, J. K., & Gardiner, E. (2010). *Barriers to treatment adherence in physiotherapy outpatient clinics: A systematic review. Manual Therapy*, 15(3), 220–228. doi:10.1016/j.math.2009.12.004
- [19] Larson-Meyer, D. E., Woolf, K., & Burke, L. (2018). Assessment of Nutrient Status in Athletes and the Need for Supplementation. *International Journal of Sport Nutrition and Exercise Metabolism*, 28(2), 139–158. doi:10.1123/ijsnem.2017-0338
- [20] Phillips, S. M., & Van Loon, L. J. (2011). Dietary protein for athletes: from requirements to optimum adaptation. *J Sports Sci*, 29 Suppl 1, S29-38. doi:10.1080/02640414.2011.619204
- [21] Andrews, A., Wojcik, J. R., Boyd, J. M., & Bowers, C. J. (2016). *Sports Nutrition Knowledge among Mid-Major Division I University Student-Athletes. Journal of Nutrition and Metabolism*, 2016, 1–5. doi:10.1155/2016/3172460