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Topic Name: Meaning scope and importance of physiology of exercise its scope in physical education

Lecture No.: 6

Lecture Title

Meaning Scope and Importance of Physiology of Exercise

Script

Welcome to the fitness world of physical education.
Today in this lesson, you will learn about exercise physiology and the role it plays in fitness. You will also learn about the areas of specialization and goals of exercise physiology.

What Is Exercise Physiology?

When you exercise, you are helping build a strong and healthy body that will be able to move around and do all the things you need it to do. Exercise physiology is simply an understanding of how your body responds to exercise. It falls under the umbrella of kinesiology, which is the scientific study of human movement.

Exercise physiology examines how your body's cells and organs, such as your cardiovascular, muscular and respiratory systems, are changed when exposed to acute (short) and chronic (long, over time) bouts of exercise.

Exercise physiology is "the identification of physiological mechanisms underlying physical activity, the comprehensive delivery of treatment services concerned with the analysis, improvement, and maintenance of health and fitness, rehabilitation of heart disease and other chronic diseases and/or disabilities, and the professional guidance and counsel of athletes and others interested in athletics, sports training, and human adaptability to acute and chronic exercise." Exercise physiologists use exercise to model or define physiological concepts, that is,

the how's and why's of the function of the human body or, how the body works. An example of this is the study of the heart as being analogous to the study of an automobile. A car enthusiast can look at a parked and non-moving automobile and marvel at its design. A physiologist wants to know how this design *works*. Under this description an automobile must be driven to determine its true qualities. Likewise, exercise must be undertaken to determine not only how the heart works but skeletal muscle as well. Moreover, a person's responses to exercise can be used to determine the potential extent of certain diseases as well as being used to rehabilitate certain disease states. Exercise and health are inextricably linked!

EXERCISE: Is the performance of movements in order to develop or maintain physical fitness and overall health. It is often directed toward also the honing of athletic ability or skill. Frequent and regular physical exercise is an important component in the prevention of some of the diseases of affluence such as cancer, heart disease, cardiovascular disease, Type 2 diabetes and back pain. TYPES: Depending on the overall effect on the body, there are three types namely: FLEXIBILITY, AEROBIC and ANAEROBIC

Types of exercise

• FLEXIBILITY: these are exercises performed to improve the range of motion of muscles and joints.

• Aerobic: rhythmic in nature, uses large muscle groups and can be maintained continuously. Here the working muscles draw on oxygen in the blood as well as fat and glucose to increase cardiovascular endurance (causes the heart to work harder than at rest) and muscle density.

• Anaerobic: involves intense or explosive sports or strenuous activity that leaves one gasping for breath. It can be done for a minute or two at a time, because it depends on limited supply of glycogen that is rapidly depleted, resulting intense muscle fatigue.

Benefits of Physical Exercise

• Maintaining physical fitness including healthy weight

• Building and maintaining healthy bones, muscles and joints

• Promoting psychological well-being.

• Reducing surgical risks

• Strengthening the immune system

Physiology

Coined from these two words “physis” meaning nature or origin “logos” meaning speech or talking about something. Physiology is the study of the mechanical, physical and biochemical functions of the body as a whole and of the structures found there in.

Exercise physiology

• It is what happens to the body as it exercises a single time, how these changes are brought about, what changes in function occur after repeated bouts of exercise and how these changes come to pass, and finally, what can be done to improve the body’s response to exercise and its adaptation to training. • It is the description and explanation of functional changes brought on by single(acute) or repeated bouts of exercise(chronic exercise or training), often with the objective of improving the exercise response

• It is the identification of physiological mechanisms underlying physical activity, the comprehensive delivery of treatment services concerned with the analysis, improvement, and maintenance of health and fitness, rehabilitation of heart disease and other chronic diseases and/or disabilities, and the professional guidance and counsel of athletes and others interested in athletics, sports training and human adaptability to acute and chronic exercise.

Scope

• Deals with such areas as:

• -cardio-respiratory responses to exercise

• -muscle fiber types

• -metabolism and body composition assessment

Scope of Practice – Exercise Physiologist

Exercise physiologists

Exercise physiologists are 4-year university qualified allied health professionals who specialise in the delivery of exercise, lifestyle and behavioural modification programs for the prevention and management of chronic diseases and injuries. EPs provide physical activity and behaviour change support for clients with conditions such as cardiovascular disease, diabetes, osteoporosis, depressions, cancer, arthritis, COPD and many more.

Physical fitness

• It is the ability to function effectively and efficiently. It is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases, and meet emergency situations

. • It is used in two close meanings: - general fitness (a state of health and wellbeing)and - specific fitness(a task- oriented definition) based on the ability to perform specific aspects of sports or occupations

Physical fitness components

Health-related

• Body composition

• Cardiovascular endurance

• Muscular endurance

• Flexibility

• Strength

Skill-related

• Agility

• Balance

• Coordination

• Power

• Reaction time

• Speed

Responses and adaptations

• Exercise results in responses and adaptations depending on TIME, TYPE, INTENSITY and frequency

• **Training**: it is the systematic process with the objective of improving an athlete's fitness in a selected activity. It is a long term process that is progressive and recognizes the individual athlete's needs and capabilities. Training programmes use exercise or practice to develop the qualities required for an event.

Responses

• These are the sudden, temporary changes in function caused by exercise. These functional changes disappear shortly after the exercise period is over. Examples are: - Increase in heart rate

- Rise in blood pressure

- Increase in breathing

Adaptations

• These are the persistent changes in structure or function following training that apparently enables the body to withstand repeated bouts of exercise. Adaptations are long term and are thus not seen until several weeks of training. Examples are: - Reduction of the heart rate for sub-

maximal exercise load. This allows the heart to pump the same amount of blood to the working muscles at a lower energy cost for the heart. - Increased muscle size after strenuous weight lifting programme. The lifter exerts greater muscular force than before training.

Why study exercise physiology in physical education

. • To answer questions on WHY and HOW of things

• To select activities

• To get information about sex differences, age differences, the effect of exercise on male and female

• To explain types of exercise for different sexes, age groups etc. ALL the above are observed for the: - Enhancement of health, physical fitness of the general population - Improvement of athletic performance

Exercise Physiology Goals

There are two distinct goals of exercise physiology:

- The use of exercise to further understand how the body functions
- The use of that knowledge to develop activities and programs that establish, maintain, and promote physical fitness

Knowing how your body responds to short-term bouts of physical activity and how it adapts to repeated bouts of physical activity over time can have a profound impact on your health and help you reach a higher level of fitness and/or health long-term.

For example, cardio or aerobic exercise can affect your mood. Immediately after a brisk, 30-minute walk, your body releases endorphins, natural pain-reducing substances that can give you a sense of well-being. Knowing that walking has a positive affect on your mood tells you that incorporating walking into your fitness program long-term may help with health issues and can reduce stress, depression, anxiety and tension.

Areas of Exercise Physiology

Exercise physiology can be split into two main areas of specialization:

- Fitness
- Rehabilitation

Fitness can help professional athletes improve their performance or help people to lose weight and become more healthy and physically fit. The rehabilitation focus seeks to provide health benefits to those suffering from diseases, such as diabetes and cardiovascular disease. It can also help people who are recovering from injuries or dealing with chronic conditions, such as arthritis and lower back pain.

What is the meaning of exercise physiology?

Exercise physiology is the study of how the body reacts to physical exercise, in both the long and short term, and how the body adapts to ongoing exercise and any changes to a routine.

It is a growing area of study in both the medical and fitness fields.

Our workout plan finder is an excellent way to get started on a new exercise program!

The growth of this discipline has given way to a large number of career paths dedicated to studying the effects of exercise on the human body.

But what is the meaning of exercise physiology? Does studying the relationship between exercise and the body's reactions to it have any tangible benefits?

Exercise physiology has many tangible benefits that doctors and fitness experts agree on.

But like any area of study, it also has its fair share of quacks that use the research as a means to promote untested exercise routines, equipment, and dietary supplements.

If you are considering the advice of an exercise physiologist in beginning a new exercise regimen, use a little bit of common sense in determining the validity of his or her claims.

What role does exercise physiology play in relation to other fields of study?
Exercise physiology most definitely plays a role in other fields including hematology, biochemistry, pathology, and cardiopulmonary studies. In fact, it's not uncommon for exercise physiologists to also be engaged in one of these other disciplines.

Exercise physiologists can be not only scientists in another field, but also clinical researchers, athletic researchers, trainers, and fitness experts. The combination of all these other disciplines serves to enhance exercise physiology most of the time.

Relying only on the knowledge of the short-term effects of cardio doesn't really address the question due to the fact that weight loss is almost always a long-term thing.

Exercise physiology is an established discipline ~~that is here to stay~~. Those involved in this field of study would do themselves and their colleagues a great service by working together to establish concrete guidelines for study and research. Researchers in other fields will also benefit by working with exercise physiologists to understand how the body reacts and adapts to physical exercise.

The Benefits of Exercise Physiology

Gain strength, increase tone and definition, drop a few pounds in the process, and improve your ability to stay strong in recovery? If it sounds like a win-win approach to handling the physical and emotional issues that often make life rough in early sobriety, it absolutely is. In fact, there are few other recovery options that are so hugely impactful across every part of a recovering person's life.

The benefits of incorporating exercise sessions into one's treatment plan include:

- More restful sleep
- Increased energy
- Improved muscle strength and endurance
- Improved circulation
- Improved mood
- Improved self-image/self-esteem
- Lowered anxiety and depression

Additionally, regular workouts can improve a person's ability to fight off relapse for the long-term in recovery, providing one of the few therapeutic resources presented in a rehabilitation program that can easily be implemented in any context, even after the recovering person leaves treatment.

Physical Detox

When experiencing withdrawal symptoms, the last thing that most patients want to do is exercise. Feeling nauseous or irritable and experiencing headaches or insomnia – most people want to avoid doing anything that could potentially cause any more discomfort. However, directed sessions with an exercise physiologist can help patients to learn specific exercises that could decrease their discomfort – especially bone and muscle pain – and even help take their minds off the cravings that are often overwhelming during the detox process.

Says Corbitt: "A strong body through exercise will fare much better when facing physical withdrawal symptoms [caused by] detox."

Even gentle exercise – walking, swimming, light weights, etc. – can provide some relief from withdrawal symptoms and even help patients to get through detox more swiftly.

Emotional Balance

Extreme ups and downs often characterize the experience of those in early recovery. Those in recovery may feel exuberant to be feeling better and more clearheaded as the withdrawal symptoms pass, but scared of what the future may hold and sad over the losses of long-term addiction. These feelings can all meld together and be difficult to manage. Exercise is a great defense against the mood swings that come with early sobriety. According to Corbitt, exercise increases endorphins, or "good feelings," and improves the person's sense of well-being while also improving self-esteem and self-confidence, which in turn can help the person to make better choices in all aspects of life.

Lauren Stobbie is a Certified Strength and Conditioning Specialist (CSCS), a USA Weightlifting Level 1 Coach (USAW), and a Crossfit Level 1 Trainer. She holds a master's degree in exercise science and has been employed at Lakeview Health in Jacksonville, Florida, for over a year. She believes that exercise sessions can be a powerful tool in facing the difficult emotions that come in early recovery.

Says Stobbie: "Regular physical activity can provide a healthy outlet for stress, depression, and other emotions they may face during early sobriety. Exercise also allows our clients to release endorphins, heal and strengthen their bodies, and improve their body image and self-esteem."

Positive New Habits

Removing use of drugs and alcohol can leave significant holes in a recovering person's schedule – holes that aren't easily or comfortably filled. For those who opt to engage in regular exercise sessions, a structure to their daily routine can naturally emerge – not just by attending the sessions themselves but by doing "homework" on off days and continuing to work on the exercise therapy goals in their downtime.

Says Stobbie: "In early sobriety, exercise provides a new activity that is healthy and can be a positive way to fill the time previously spent using substances.

Every week clients notice changes in their endurance, strength, and physical appearance, and this motivates them to continue. Establishing a regular exercise routine allows clients to set goals and experience the sense of accomplishment when they reach them. Exercise is a vital component of early sobriety and can lay the groundwork for a healthy lifestyle and successful recovery."

Corbitt agrees, saying that exercise sessions encourage patients to create goals and challenge themselves: "When we have goals, we tend to focus on those and not the outside distractions."

Personalized Therapy Sessions

Like every part of addiction treatment, exercise physiology sessions should be personalized to meet the needs of the individual. No two people are alike in their experience of addiction and thus their experience in recovery should be unique as well – and that especially applies to their exercise sessions.

Says Stobbie: "A client's exercise physiologist should always be able to modify their workouts for any injuries and should be able to adapt all programming to meet their specific needs. They should be able to update their exercise prescriptions for each client as necessary. Their exercise physiologist should be able to perform body composition or anthropometric assessments if needed."

Increasing the Effects of Exercise Sessions

Patients can get the most out of their exercise sessions by implementing other positive practices and behaviors in their lives – not just during the exercise session but throughout the week as well.Corbitt says that attitude changes everything: "I have experienced patients coming into the fitness center with no motivation or desire to work out at all. They don't care and are dragging, but after we talk and I convince them to get started, the change in their mood and how they leave – they are like two different people. This has such an effect on me, to witness them going from 'gloom' walking in to leaving feeling good about themselves and wanting more. I've literally seen people change after a session!"

Stobbie also says that taking part in other holistic treatment options like acupuncture, meditation, massage therapy, and outdoor sports and activities will benefit the patient's ability to make progress in exercise sessions.

Additionally, patients are encouraged to get the most out of their exercise sessions by:

- Eating healthfully throughout the week
- Maintaining a regular sleep schedule
- Attending all exercise sessions
- Showing up with a good attitude and ready to train
- Avoiding putting pressure on themselves
- Setting small goals
- Celebrating the progress they make