CHAPTER I

Why Measure Physique?

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A desire to measure human physique stems from its relationship with many factors influencing the human condition, and from various perspectives of health and human performance in medical, sport and work settings. Health and physical performance are inextricably linked. Some of the many reasons we are interested in measuring physique are summarised below.

Key Points

Medical and General Domains of Application

- Certain traits of physique are strong indicators of an increased risk of disease.
- Detecting and quantifying undernutrition and overnutrition across all age groups - from newborns to the elderly – is crucial for developing strategies to tackle global health challenges.
- Sexual dimorphism in morphology and body composition has numerous implications across a range of fields, including medicine, sport, nutrition, ergonomics, and the fashion industry.
- Physique characteristics are closely associated with physical activity and dietary habits.
- The physical status of an individual depends strongly on anthropometric and body composition variables.

Impact of Physique on Performance and Health in Sports

- In most sports, morphological and body composition optimisation impacts performance.
- Monitoring physique provides feedback on the effectiveness of training and nutrition interventions.
- Tracking the physique of athletes is essential for developing and stabilising their performance and health status throughout their careers, and can help avoid extremes that jeopardise health.
- Physique plays an important role for talent identification of young athletes.
- Monitoring the size, composition, and growth of developing athletes is fundamental for tailoring training programs to their individual needs.
- Effective training and performance strategies in many sports should consider sex-specific differences in constitution.
- Injury risks are linked to certain physique variables.
- In many sports, tailoring equipment and gear to the athlete’s morphology enhances performance and safety.
- In some sports, competition rules can be adjusted to prevent the pursuit of unhealthy body ideals.

Human physique assessment encompasses three primary capacities or characteristics – body size, shape and composition. Regardless of the reasons for undertaking these measures, it is self-evident that the chosen methods used to assess these variables should be valid, accurate and reliable. These requirements are generally met at a sufficiently high level in anthropometric measurements; however, in body composition assessments, extremely large margins of error are frequently tolerated, resulting in confusion rather than clarity. Further confusion arises when measurements of body fat (BF; determined at the molecular level, consisting of the lipids distributed throughout the body) are confused with measurements of adipose tissue (AT, determined at the anatomical level). These are different quantities; however, AT contains the major part of BF. According to a widely recognised model by Wang [1], body composition can be analysed at five levels: the atomic, molecular (chemical), cellular, anatomical (tissue/organ), and the whole-body level.