

Kristians Savickis
Sports and exercise science
Human Physiology and Fitness
The University of Wales Trinity Saint David

The ability to assess and interpret health and fitness data is a fundamental skill for professionals in human physiology and fitness. Analysing results is important for building a strong foundation in this area. This assignment aims to evaluate my ability as a first-year student to carry out a variety of health and fitness assessments using basic equipment. I will collect and analyse data related to the client's health and fitness. Based on my data, I will provide recommendations that support the client's health and fitness goals.

Assessing a person's health and fitness status requires a rounded approach that involves various components of fitness, including body composition, cardiovascular fitness, muscular strength and endurance, and flexibility. The assessments chosen provide valuable insights into practical application in health and fitness settings.

For body composition, the skinfold test is a measurement technique using callipers. It is a widely accepted and practical method. It estimates body fat percentage by measuring the thickness of skin folds in specific areas. It's "quick, inexpensive, and easily performed".

(www.todaysdietitian.com, n.d.) Understanding body composition is crucial as having a high body fat percentage is associated with increased risk of cardiovascular disease, diabetes, and other chronic conditions (ACSM, 2022).

For cardiovascular fitness, the Astrand bike test is a valued exercise test that estimates VO₂ max based on your heart rate response to a steady workload on a cycle ergometer over six minutes. It is ideal for all fitness levels, because it is safe, relatively simple to perform, and requires minimal maximal effort (Åstrand & Ryhming, 1954; McArdle, Katch & Katch, 2015). The test shows effects between heart rate and oxygen uptake during submaximal exercise, providing good insights into cardiovascular efficiency.

Muscular strength is assessed using the Handgrip Dynamometer Test. It's a quick and easy-to-use tool that is widely used in a clinical and field setting as an indicator for overall muscle function and ageing-related decline (Roberts et al., 2011). The push-up test is the perfect test for muscular endurance, it is used for its simplicity and effectiveness in measuring upper body endurance (ACSM, 2022).

The Sit and Reach test is used for assessing flexibility. Mainly targeting the hamstrings and lower back. Flexibility plays a huge role in mobility, injury prevention and posture. Other measures, like resting heart rate, provide further information about cardiovascular health and risk factors for chronic disease (WHO, 2023). These assessments are an accurate evaluation of a person's health and fitness status.

Assessment procedures are important as accurate health and fitness assessments depend on good procedures. Consistent methods and appropriate equipment will give the most reliable results that can be interpreted and compared. Body composition is assessed using skinfold callipers. For men, measurements are taken at the chest, abdomen and thigh; for females, it's the tricep, suprailiac, and thigh. The skinfolds are pinched and measured using callipers, with each site measured at least twice to ensure consistency (Heyward & Wagner, 2014). Muscular strength is measured with a handgrip dynamometer. The procedure starts with the subject standing upright, holding the dynamometer at thigh level, and squeezing as hard as possible. Three attempts are recorded for each hand, and the highest score is noted (Roberts et al., 2011). The Push-Up test is used for testing muscular endurance. The participant performs as many push-ups as possible without rest, while maintaining standardised cadence and technique. Only correct reps are counted to ensure consistency (ACSM, 2022).

For cardiovascular fitness, the Astrand bike test is used. The subject pedals at a steady rate, which is around 50 rpm for six minutes at a set workload dependent on gender and fitness levels. Heart rate is then recorded for the final minute, and VO2 max is estimated using equipment such as a cycle ergometer and a heart rate monitor (Åstrand & Ryhming, 1954). Making sure standardised procedures are maintained provides validity and reliability in assessments. Having different or poor technique, faulty equipment, or poor weather conditions can cause measurement error, affecting the accuracy of results. For example, in the skin fold assessment, the results can vary with inconsistent pinching, while grip strength can vary based on hand position or fatigue (Heyward & Wagner, 2014). To keep errors as minimal as possible, the assessors must follow strict protocols, use the right equipment and undergo training, repeating assessments, using the same timings and conducting tests in controlled environments also help enhance reliability and fair testing. Correct procedures and standardisation are important in producing valid and meaningful data that inform health evaluations and program development.

The report below shows data collected from four health and fitness assessments: the skinfold test, grip strength test, push-up test, and Astrand bike test. Results are displayed in a table, compared to recognised norms, and analysed to identify strengths, weaknesses, and areas needing improvement.

Test	Results	Reference Norm	Interpretation
Skinfold body fat% MALE	18%	10-20% (ACSM, 2021)	Healthy
Grip strength RIGHT/LEFT	42 kg R 40 kg L	40-49 kg (Dodds et al., 2014)	Average
1-Minute Push-up test	35 repetitions	>30 (ACSM, 2021)	Above Average
Astrand Bike test	44 ml/kg/min	42-46 ml/kg/min	Good

VO2 MAX		(Heyward & Gibson, 2014)	
---------	--	--------------------------	--

The skinfold test results showed a body fat percentage of 18%, putting the participant within the healthy range for male adults. This tells us that the male has a body composition that consists of balanced fat and lean mass (ACSM, 2021). Keeping a healthy body fat percentage is important for a healthy lifestyle and aids in physical performance.

The grip strength results are 42 kg on the right hand and 40kg on the left hand. Compared to the norms for males aged 20-29, the results are in the average category (Dodds et al., 2014). Grip strength is linked with general muscular strength. The results are acceptable, but improvements through resistance and strength training are recommended.

The push-up test, which assessed the upper body muscular endurance, had a total of 35 repetitions in one minute. This has gone over the average of 30 repetitions for adult males (ACSM, 2021). This has shown strong muscular endurance in the upper body, which is very important for athletic and daily activities. Again, if the participant wants to improve, resistance training with a mix of strength and higher volume (more reps/less weight) can help improve.

The Astrand bike test estimated a VO2 max of 44 ml/kg/min. This falls into the good category for males aged 20-29 (Heyward & Gibson, 2014). Having a good score on this test shows that the participant has good aerobic capacity and cardiovascular endurance. Having good scores is linked to better overall endurance and can reduce the risk of disease. The way to improve your scores for this assessment is by doing cardiovascular exercise and reaching different levels of heart rate.

The participant shows strengths in cardiovascular fitness and muscle endurance. Having strengths in these areas is essential for physical health, good energy levels and reducing the risk of heart disease. The body composition of the participant is healthy, incorporating training like high-intensity interval training and resistance training, could help reach further improvements in lean mass and metabolic health.

The one area the participant would need to improve is muscular strength; the grip strength test results show an average level, which is not of concern. An increase in strength training can help with physical performance and improve injury resistance. The fitness assessment results show a balanced and healthy profile. Good cardiovascular fitness and muscle endurance, with room for improvement in muscular strength through strength training. These results, compared to the norm, offer a good foundation for making structured fitness plans aimed at developing a better lifestyle. Improved health and performance.

To address the recommendations, a program consisting of compound lifts such as deadlifts and bench press while focusing on progressive overload will improve grip strength and muscular development. Maintaining and improving cardiovascular fitness by doing steady-state cardio or interval cardio training twice a week is advised to sustain VO2 max levels. Having a protein-rich

Student Number: 2304591 Module Code: BMSS4007

diet, good hydration, and reaching the right amount of sleep per night (typically 7 to 9 hours) will support recovery, help with muscle growth and reach optimal results (ACSM, 2021). These recommendations are taken from the participants' fitness assessment results, and will help with building their existing strengths and target in improving specific areas identified as weaknesses. Ultimately leading to a better quality of life and long-term wellbeing.

Word count - 1406

Reference list

- ACSM (2022) *ACSM's Guidelines for Exercise Testing and Prescription*. 11th ed. Philadelphia: Wolters Kluwer.
- Åstrand, P.O. & Ryhming, I. (1954) 'A nomogram for calculation of aerobic capacity (physical fitness) from pulse rate during submaximal work', *Journal of Applied Physiology*, 7(2), pp. 218–221.
- American College of Sports Medicine (ACSM), 2021. *ACSM's Guidelines for Exercise Testing and Prescription*. 11th ed. Philadelphia: Wolters Kluwer.
- Dodds, R.M., Syddall, H.E., Cooper, R., Benzeval, M., Deary, I.J., Dennison, E.M., Der, G., Gale, C.R., Inskip, H.M., Jagger, C. and Kirkwood, T.B.L., 2014. Grip strength across the life course: normative data from twelve British studies. *PLOS ONE*, 9(12), p.e113637.
- Heyward, V.H. & Wagner, D.R. (2014) *Applied Body Composition Assessment*. 2nd ed. Champaign: Human Kinetics.
- Heyward, V.H. and Gibson, A.L., 2014. *Advanced Fitness Assessment and Exercise Prescription*. 7th ed. Champaign, IL: Human Kinetics.
- Roberts, H.C. et al. (2011) 'A review of the measurement of grip strength in clinical and epidemiological studies: Towards a standardised approach', *Age and Ageing*, 40(4), pp. 423–429.
- World Health Organization (WHO) (2023) *Cardiovascular diseases (CVDs)*. Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)) (Accessed: 20 May 2025).
- www.todaysdietitian.com. (n.d.). *CPE Monthly: Assessing and Monitoring Body Composition - Today's Dietitian Magazine*. [online] Available at: <https://www.todaysdietitian.com/newarchives/0917p50.shtml>.