

range of university sports teams. However, inclusion and exclusion criteria should still be set. Inclusion criteria relate to any specific factors that are required to be able to participate in the study. For example, do the participants have to play specific sports, play at a given competitive standard or train a certain number of times per week? In the case of sports therapy projects do participants have to have suffered a certain injury? These factors are important for the application of your results and can increase the validity of your study considerably. Exclusion criteria are not just the opposite of inclusion criteria but relate to factors which mean not all of your potential participants are able to take part. Examples here may be having certain medical conditions. For example, would asthmatics or diabetics be able to take part in your study or would these conditions affect the results in a different way to other participants? Conversely, these conditions may also be used to define the specific population that you are interested in studying.

3.2.3 Ethics, informed consent and health screening

3.2.3.i Ethics

As you read more journal articles you will see that after the participant information has been provided there should be a statement about ethics approval and informed consent. All research studies must have received some form of ethics committee approval to allow data collection to proceed. Reporting ethics considerations is mandatory for published studies (Azevedo *et al.*, 2011) with a number of journals requiring reference to specific statements or guidelines (e.g. Harriss and Atkinson, 2009).

Ethical approval can be obtained through an institutional ethics committee, as in the case of many universities, or through other avenues such as the local health authority or clinically related ethics committees (e.g. the Integrated Research Application System or 'IRAS'; see <https://www.myresearchproject.org.uk/>). You may have read some published studies noting ethics approval through the 'Institutional Review Board', which is the route taken for ethics application in the United States. You may also see reference to work being 'in accordance with the Helsinki declaration', which ensures that all research is undertaken with, amongst other factors, patient (participant) safety in mind (BMJ, 1996). When considering your ethics application you are also likely to come into contact with the data protection act (<http://www.legislation.gov.uk/ukpga/1998/29/contents>) and, if using human tissues in any way, the human tissues act (<http://www.legislation.gov.uk/uksi/2008/3067/contents/mad>). Your tutors can give you further guidance on these important aspects.

Ethical approval is of key importance for undergraduate and postgraduate projects and for all aspects of research undertaken. However, for the laboratory classes you undertake within your taught courses all procedures are likely to be standard or established protocols with an associated risk assessment already undertaken to reduce any potential harm to the participants or experimenter. In this instance you personally will not have had to apply for ethics approval. Consequently, the general procedure for laboratory classes is for participants to complete a health screening questionnaire and provide written informed consent.

3.2.3.ii Informed consent, health screening and risk assessment

Once a research study's ethics application has been approved data collection can proceed. Each participant will be given a participant information sheet in which

all procedures are clearly outlined using terminology non-experts can understand. Terminology is very important here as not all of your participants will be studying the same degree as you or have the same specific knowledge. Consequently, participants may not understand the tests to be done or the terminology that you use. Once the consent form has been read and the participant is happy to proceed they must sign the informed consent form to state that all aspects of the study have been understood and they understand that they are able to withdraw at any time without question or consequence. This process is usually summarised as 'participants gave written informed consent' and is provided once at the start of the study prior to any experimental testing occurring.

In contrast to informed consent, a health screening form should be completed before every testing session. The health screening form is a declaration of the participant's health at that time and does not usually contain any details regarding the study itself, other than a statement regarding the specific tests or protocols planned for that specific testing session. The health screening form used is likely to be written specifically by your university or research institution based on nationally or internationally recognised guidelines and procedures (e.g. British Association of Sport and Exercise Sciences, American College of Sports Medicine). In your laboratory reports it is important to be specific as to which forms have been completed. The forms used are often confused by undergraduate students and incorrectly reported. A health screening form is completed by every participant prior to any testing session, be it a lab class or project testing session. However, for final-year projects participants complete *one* informed consent form at the start of the study and a health screening form at the start of *every* testing session.

As part of your project ethics application you will most likely have to complete a risk assessment form for the tests and procedures proposed. Here, the term risk refers to all aspects of health and safety and any potential injuries or unexpected events which could occur. As with health screening forms this is usually institution specific and not completed by students for lab classes. This will have been done previously by staff. However, undergraduate students must submit ethics applications for their final-year projects and completing a risk assessment form is an important component. There is always a potential risk when exercising, and it is the measures undertaken to reduce this risk that are important.

3.2.4 Pre-testing considerations

In every methods section you read there will be, or should be, a range of factors considered to try and reduce the amount of variation and error within the data collected. Some general factors are described below but there are likely to be other factors specific to your own study which may potentially contribute to error in your data.

3.2.4.i Circadian rhythms

In research studies that examine performance in some way you will often read that testing occurred at the same time of day but on different days. This is due to the effects of the body's endogenous circadian rhythms on human physiology. Circadian rhythms essentially reflect our body clock with many physiological responses co-varying with changes in body temperature over a 24-hour cycle (Atkinson and Reilly, 1996; Reilly, 2007). There are numerous studies that evaluate the effects of circadian rhythms on