

The language of research (part 3): cross sectional studies

KEY WORDS

- ▶▶ Cross sectional
- ▶▶ Methodology
- ▶▶ Method
- ▶▶ Prevalence
- ▶▶ Quantitative
- ▶▶ Research

In the first and second articles in this series, we introduced research paradigms and the idea of research methodologies and methods. In subsequent papers, we will examine more of the terminology associated with undertaking research and some of the methodologies and methods that may be used in health and social care research. In this, the first of the methodology papers, we will explore cross sectional studies, which are sometimes also known as 'prevalence surveys'.

Cross sectional studies are perhaps the most widely used methodology in health and social care research — or within any research discipline for that matter. They are simple to undertake and produce immediately useful results, which may be used to support practice or in the development of policy or procedures.

One good analogy to describe cross sectional studies is the idea of cutting through a stick of seaside rock (the confectionary) to see what is written at a given point along its length. As with the message at a single point of the stick of rock, cross sectional studies only tell you what is going on at a single point in time and within the sample, and may not actually represent reality, or the long-term view of an issue (as in cutting through the stick of rock at a different point and finding a different message).

In term of health care, cross sectional studies are used to establish the prevalence of a health outcome or cause of disease, or possibly both phenomena, at a single point in time (McKenna et al, 2006). The measurement taken only applies to the group of people in whom the measurement has been taken — the sample — and may or may not, readily translate to a wider group of people — the population. This can be a limitation of these types of studies, especially where the researcher wants to 'generalise' (a term we will explore in a later paper) to the wider population.

Some commentators confuse the use of the terms 'incidence' and 'prevalence' using them as if they are synonymous. They are not and it is important to understand this when undertaking or reading a cross sectional survey. Prevalence, therefore, refers to the number of events at a point in time (e.g. the number of

people waiting more than 6 weeks to have a Doppler assessment), while incidence refers to the number of new events over a defined period of time (e.g. the number of patients developing a leg ulcer and being referred to a clinic over a set period of time).

Cross sectional studies may be used to help in the development of hypotheses, which are then subjected to testing by other quantitative research methodologies (Gordis, 2012). This is because they produce simple measures of something and cannot be used to demonstrate cause and effect — as is the case with prospective research methods, such as cohort studies and randomised controlled trials (see later articles in the series for further discussion).

Cross sectional studies are quick, cheap and easy to conduct and because of this are a popular epidemiological study methodology. Many surveys are cross sectional in nature as they measure the opinions of individuals at a point in time without trying to demonstrate why a particular opinion is held. This is the case in the surveys taken in the lead up to an election, for example.

Cross sectional studies are also widely used in collecting data for audit purposes as audit is usually concerned with collating numbers that relate to the prevalence of particular occurrences. They can be especially useful in gathering benchmark data — real-time data that demonstrates the size of a problem at a specified point in time; subsequent data collection might be used after an intervention has been applied in order to demonstrate the efficacy of the intervention.

The article by MacDougall et al (2014) in the last edition of *Wounds UK*, collected some survey data on the amount of time patients waited for Doppler assessment of their leg ulcers in both 2011 and 2013. This is an example of two cross sectional surveys used to demonstrate the change in waiting times prior to and following a change in practice and is, therefore, useful as an easy measure of how effect the change has been — the use of parallel data collection in the manner shown in MacDougall et al (2014) study might be considered to be a pre-test post-

test quasi experiment, a methodology we will explore later in the series.

QUALITY OF DATA COLLECTION

Cross sectional studies can be used to collect simple waiting time data or more complex data, which requires the application of a previously validated data collection tool (usually a questionnaire). One example of a validated tool that is in wide use is the short form 36, which is used widely to measure people’s functionality and wellbeing.

Validity refers to how well a tool of data collection actually measures what it sets out to measure (Ellis, 2013). For instance, we know that a thermometer measures temperature because it is designed, built and calibrated to do so; but a question can have multiple meanings or can be interpreted differently by different people. So asking a question about whether a leg ulcer is interfering with someone’s daily living will elicit responses that relate as much to a person’s interpretation of the activities of daily living as it does to whether the ulcer is actually inhibiting any of their activities. An ulcer will interfere more in the life of an ordinarily active person than someone who is sedentary and so the answer would be relative anyway.

PROS AND CONS OF CROSS SECTIONAL SURVEYS

As previously mentioned, cross sectional surveys are quick and easy to carry out. They are cheap and generally effective at eliciting responses to simple questions. For these reasons, they are widely used and any researcher can quickly become adept in their use with limited practice.

Cross sectional studies only measure variables at a given point in time so while there is a temptation to presume a causal relationship between two variable that are measured at the same time, e.g. age and the development of a leg ulcer; cross sectional studies cannot, however, be used to demonstrate cause and effect.

Box 1: Prevalence: the proportion of people in a defined population that has the outcome of interest at a defined point in time.

For example:
<ul style="list-style-type: none"> ■ The proportion of the population with diabetes ■ The number of people with a leg ulcer on the 31st December ■ The number of people using a pressure-relieving mattress on the ward in a specific week

Another drawback of cross sectional studies relates to the fact that they often require some recall on the part of the participant. Asking people to remember something from their past, such as exposure to carcinogens, is fraught with problems. First of all, people may not understand what is being asked and secondly their recall may not be accurate. This is a form of bias (a deviation from the truth), which is a term we will explore later in the series.

CONCLUSION

Cross sectional studies are useful for many purposes in the health and social care sector. They can be used to establish the prevalence of any number of variables cheaply, quickly and usually with some accuracy. They cannot, however, be used to demonstrate cause and effect.

In the next article in this series, qualitative methodology and phenomenology will be explored, along with their application to health and social care research. WUK

REFERENCES

Ellis P (2013) *Understanding Research for Nursing Students* (2nd edn). Sage, London

Gordis L (2012) *Epidemiology* (4th edn). WB Saunders Company, London

MacDougall M, Robinson L, Welsh L (2014) Standardisation through clinical audit: An example of good practice in leg ulcer management. *Wounds UK* 10(3): 38-47

McKenna H, Hasson F, Keeney S (2006) Surveys. In Gerrish K, Lacey A, eds. *The Research Process in Nursing* (5th edn). Blackwell, Oxford