

# 11 Notes and tips on surveys

*Philip Hurst and Stephen R. Bird*

## Chapter aims

The aims of this chapter are to introduce the reader to survey research and its application within health and physical activity. Depending on the reader's intended research methods, it may be beneficial to read this chapter alongside ~~those~~ on interviews and focus groups, and questionnaires, given that much of the information presented in these chapters relates and informs the others to provide a more comprehensive coverage. These chapters have been presented in this way to provide an informative coverage of the topic without excessive duplication and repetition of material.

## Introduction

A survey is a research tool that gathers information from a relatively large sample of people to help provide inferences about a wider population. Survey data are cross-sectional and can be collected in many formats, such as questionnaires, interviews and focus groups. They are designed to provide a snapshot about a particular subject at that particular time. Data obtained from these methods are essential to many types of research in health and physical activity and offer the opportunity for innovative, efficient and cost-effective research, which can help inform decisions in clinical and applied settings.

Data collected from a survey can enable the researcher to: (1) determine whether there are any associations between factors (e.g. exercise and gender); and (2) compare characteristics of different groups or situations (e.g. do females exercise more than males?).

Surveys play a fundamental role in generating both quantitative and qualitative data for health and physical activity. While researchers often favour the randomized controlled trial (RCT) for its ability to determine cause and effect, surveys offer the opportunity to generalize findings to a larger population – which is practically impossible to obtain via RCTs. Surveys are therefore a valuable research tool that can shape policy guidelines and identify issues, and potential causes of physical activity and health issues that may be further investigated via additional surveys or other techniques such as RCTs.

## Designing the survey

The ultimate aim of a survey should be to gather valid, reliable, unbiased data from a representative sample of participants.<sup>1</sup> While there is no universal recommendation

on best practice in respect to survey design, it is accepted that careful attention is given to how easy it is for respondents to understand and complete it. In short, the task required to interpret the survey and provide responses should be as easy as possible. Given this, the words used can significantly influence how well the reader will understand and interpret the questions on a survey. The use of jargon (i.e. any word or phrase that is difficult for a layperson to understand), such as medical terms, or abbreviations/acronyms, can influence the nature and quality of responses. For instance, LeBlanc et al.<sup>2</sup> reported that lay people may not understand common terms used in medical practice (e.g. malignant and tumour), and that ambiguous words such as 'growth' or 'ability' can be confusing for the reader.

Another factor argued to influence the quality and nature of responses is how long the survey takes to complete (otherwise known as response burden). It has often been suggested that if a survey takes longer to complete, it will result in lower response rates and reduced data quality. However, in a meta-analysis examining response rates and questionnaire length, Rolstad, Adler, and Rydén (2011)<sup>3</sup> indicated that response rates were not influenced by survey length but how easy it was to complete. Shorter questionnaires requiring more complex answers are more likely to have lower response rates than longer questionnaires with easier answer options. Thus, if a survey requires greater cognitive effort to complete, response rates and the quality of the data are more likely to be lower.

A survey will be designed on the basis of how it best answers the research question(s) and like other forms of research, will come to light from a literature search, previous research, a particular scenario and/or a need for an issue to be addressed. Furthermore, some consideration of how the data will be analysed will guide the study design (e.g. whether the data needs to be quantitative or qualitative). Indeed it is the relationship between the research question(s) and how best to answer it that will guide both data collection and how to interrogate the data. For this reason, it is important that the survey is carefully planned and piloted before any data are collected. The design, structure and order of questions can thus affect the responses obtained, and researchers should be aware of any biases that may influence responses. Further information regarding the design of other types of survey research is provided in the relevant chapters on interviews, focus groups and questionnaires.

### The survey sample

Since most surveys will collect data from a proportion of a population (i.e. it would be impractical and unethical to collect data from every person of that population), a sample of the population has to be selected. To illustrate how this could be achieved, take the following hypothetical example. Public Health England wants to survey the physical activity levels of patients diagnosed with hypertension in the country. As it would be impractical and costly to survey every patient, a sample is selected. In this example, Public Health England could obtain a list of patients diagnosed with hypertension from hospitals in England and subsequently administer the survey to a proportion of this population.

The survey could also seek to determine whether there are differences between population within a sample. Given that a survey aiming to include all types of people within a population may result in less meaningful data (e.g. if all age groups are considered, it is quite probable that the situation and responses of a 35-year-old may differ from that of an 80-year-old), researchers should clearly indicate their sample

~~and why they are being targeted. Alternatively, researchers could ask respondents' their age in the survey and identify if there are differences in physical activity levels of hypertension patients between different age groups.~~

When defining the survey sample, it is important that the sample is representative of the larger population that it will infer too. If this is not achieved, accurate conclusions cannot be drawn about that population. In short, a sample should include participants who reflect the characteristics of that population, such as age, sex, BMI, disease history, socioeconomic status and others that may be relevant to the topic being investigated.

## Recruiting a sample

A common issue within survey research is that those who are most likely to respond to it are those with an existing interest in the topic. Hence, even if researchers were to contact every person in their defined population, they may still get some bias in those who respond, unless they were to get a 100% response rate. In a more common scenario of researchers only having the capacity, time and resources to contact a sample of their defined population, they may need to take steps to ensure that it is representative. For these reasons, researchers need to consider the type of sampling strategy they use when recruiting.

Researchers can use two forms when recruiting a sample: random and non-random. ~~Broadly speaking, random sampling uses quantitative methods (e.g. questionnaires), whereas non random sampling uses qualitative methods (e.g. focus groups and interviews).~~

### *Random sampling*

#### *Simple random sampling*

The most common and stringent technique is simple random sampling. This should help to reduce the risk of bias within the sample at this stage, although as previously mentioned, bias may still occur through differing response rates. Using this method, participants are chosen by chance and the probability of a person being selected to the sample is equal for everyone. Using the Public Health England example above, after choosing the sample, each person could be given an ID number and random numbers are then selected for inclusion into the study. To randomly assign participants to the sample, a quick and cost-effective method could be to use an online, computer-generated software programme (e.g. [www.randomizer.org/](http://www.randomizer.org/)).

#### *Stratified sampling*

If the researcher was to use stratified sampling, they would divide the population into homogenous groups by factors, which are called strata (stratum is singular). The researcher would then separate the sample according to these factors and randomly select people from strata to be recruited to the study. The sample could be divided by a variety, or a combination of strata, such as gender, socioeconomic status and geographical location. For the Public Health England example, the researcher may

divide the population into physical activity level and take a random sample from the stratum. For stratified sampling, it is important to note that the strata are representative of the entire population and that one person should not be included into multiple strata. If strata are overlapping, selection bias is increased as the probability of a person being selected is higher.

### *Cluster sampling*

When a population is widely scattered, it may be difficult to select a sample that is representative of the population. Cluster sampling can combat this issue by dividing the entire population into 'clusters' or groups. These clusters can be divided by geographical areas, such as cities, schools, sports clubs and fitness groups. The clusters are chosen randomly and people within the clusters are sampled. Using the hypothetical example above, instead of sampling the entire population of England diagnosed with hypertension, the sample could be divided into clusters based on cities. The researcher would then randomly select a sample from within that cluster.

### *Non-random sampling*

Non-random sampling purposefully targets people within a population. In qualitative research, this is often the most common form of sampling where participants who meet pre-selected inclusion criteria (e.g. age, gender, physical activity level) are recruited to the study. In survey research this is less common given that results from the data cannot be generalized beyond the sample. There are three main types: (1) *Convenience sampling*: researchers recruit anyone from the population if they are willing to take part in the research. (2) *Purposive sampling*: a population is identified and participants within this sample are recruited. (3) *Snowball sampling*: after a participant has completed the survey, the researcher may ask them to invite others to take part in the study.

Regardless of the type of sampling method used, researchers need to be aware of the strengths, weaknesses and statistical implications of each. All methods are not free of limitations. The aim of the researcher should be to use the most appropriate sampling method and ensure that the sample recruited is representative of the population they are inferring to.

### **Sample size**

There is no definitive answer to what sample size is needed for survey research. As already suggested, the most representative sample would be one that included almost all members of a particular population group. However, to do this would be unethical, as the use of a sample that is larger than necessary is a waste of resources and participants' time, if the information collected could be obtained using a smaller sample size. On the other hand, the use of a sample that is smaller than necessary would provide uninformative results that do not reflect the population and may ~~therefore~~ ~~equally~~ be a waste of resources and participants' time.

Researchers need to think pragmatically and consider what a reasonable level of representativeness and validity could be attained balanced against the amount of time

and resources available. They will need to consider the study objectives and design, the anticipated endpoint, type of sampling used and the type of statistical analysis. There are methods by which a 'reasonable' sample size can be calculated and are akin to the statistical power calculations used in intervention studies. These calculations factor in the sampling error (i.e. the sample not being representative of the population), which will get smaller as the size of the sample gets closer to the whole population group. Statistical software such as G\* power can be used to calculate sample size; however, if the researcher is unfamiliar with statistics a statistician should be consulted.

It is rare that everyone asked to complete the survey will actually complete it. Researchers should therefore anticipate non-responses in sample size calculations to ensure a sufficient sample size. The number of people who complete the survey to the number of participants recruited should be reported in the results. While there is no agreed-upon standard for acceptable response rates for surveys, it has been suggested that an acceptable response is between 60% and 75%.<sup>4</sup> If response rates are lower than 60% it could be argued that the final sample may not reflect the population and indicate a higher likelihood of response bias. Researchers should therefore be aware that while a larger sample is desirable, high non-response rates can be more damaging to the credibility of the results than a smaller sample size.

In addition to the problems caused by potential bias resulting from some of the contacted sample not responding, further problems can arise if participants completing the questionnaire give responses that are what they deem to be socially desirable (i.e. participants present a favourable image of themselves). For example, participants responding to questions about physical activity levels may over-report how much they actually do, whereas questions about anti-social behaviours (e.g. drug use) may encourage participants to under-report their actual use. These types of surveys may therefore be susceptible to social desirability and affect the validity of the survey. To overcome these issues, researchers can use social desirability scales to detect and assess the extent of social desirable biases. Several social desirability scales have been developed since the first scale was published in 1957 (see Perinelli & Gremigni, 2016 for review)<sup>5</sup> with the most popular scales being the Marlowe Crowne Social Desirability Scale (MCSDS)<sup>6</sup> and the Social Desirability Scale-17 (SDS-17).<sup>7</sup>

### **Ethical considerations**

Like any other form of research, surveys will need to be scrutinized by the relevant ethical committee before any data is collected. Researchers have an ethical duty to ensure they are respecting each respondent's autonomy when completing the survey and should ensure confidentiality of the data. Before a person completes a survey, they should be fully informed of the purpose of the study, including any risks and benefits, and consent to participate. Similarly, upon participation, persons should be made aware that they have the right to withdraw from the research without reprisal. This would be available to them throughout the stages of data collection, but not be possible after the data has been published – a point that may need to be stated in the information and consent documentation (see Chapter 7).

Particular concern is needed when involving vulnerable populations (e.g. children, people with learning difficulties or patients in care) and covering sensitive topics (e.g. drug use). In these circumstances, researchers should ensure that participants from



these groups are given ample opportunity to understand the nature, aims and anticipated outcomes of participation. For vulnerable groups, such as children, informed consent should be sought from persons legally responsible on their behalf. Parents or guardians should have the opportunity to understand what the research requires of their child and the benefits and risks associated with it. In cases involving sensitive topics, researchers should ensure to respect the privacy of participants and ensure that any information about them cannot be identifiable by other parties. Further information about the consent procedures for vulnerable populations and sensitive topics can be found on the American Psychological Association or British Psychological Society websites.

### Reporting the results

Once the researcher has collected the data, they will need to consider how the data will be reported. Reporting the results of survey research should allow the reader to easily appraise whether or not the research is to have any impact on health and physical activity. For example, the results and reporting of survey research could allow other researchers to guide future investigations, applied practitioners to judge which treatment is best for their patients and policy makers to establish the best preventative and treatment strategies. Survey research therefore needs to be reported transparently so that the reader can follow what was planned, what method was used, what results were discovered and what conclusions can be made. To ensure clarity and appropriateness in the reporting of results, researchers should consider the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) statement, which consists of a 22-item checklist.<sup>8</sup>

### Conclusion

Surveys allow the researcher to gather information from a relatively large sample of people to help provide inferences about a wider population. To ensure that the results from survey research are reliable and of quality, researchers need to maintain the same level of rigour as any other form of research. This requires systematic and thoughtful planning in the design, delivery and reporting of the survey. As mentioned in this chapter, there is no universal standard for best practice in respect to survey research, but there are certain steps that should be followed when sampling, designing and reporting the results. How this is achieved will depend on the aims of the research and the anticipated outcomes. In general, the aim of survey research should be to collect unbiased, valid and reliable data from a representative sample that can help provide further information about a wider population.

### References

- 1 McColl E, Jacoby A, Thomas L, Soutter J, Bamford C, Steen N, et al. *Design and use of questionnaires: a review of best practice applicable to surveys of health service staff and patients. Health Technol Assess.* 2002; **5**(31):1–256.
- 2 LeBlanc TW, Hesson A, Williams A, Feudtner C, Holmes-Rovner M, Williamson LD, Ubel PA. Patient understanding of medical jargon: a survey study of us medical students. *Patient Educ Couns.* 2014; **95**:238–42.

- 3 Rolstad S, Adler J, Rydén A. Response burden and questionnaire length: is shorter better? A review and meta-analysis. *Value Health*. 2011; **14**:1101–8.
- 4 Draugalis JR, Coons SJ, Plaza CM. Best practices for survey research reports: a synopsis for authors and reviewers. *Am J Pharm Educ*. 2008; **72**:11.
- 5 Perinelli E, Gremigni P. Use of social desirability scales in clinical psychology: a systematic review. *J Clin Psychol*. 2016; **72**:534–51.
- 6 Crowne DP, Marlowe D. A new scale of social desirability independent of psychopathology. *J Cons Psychol*. 1960; **24**:349.
- 7 Stöber J. The social desirability scale-17 (Sds-17): convergent validity, discriminant validity, and relationship with age. *Eur J Psychol Assess*. 2001; **17**:222.
- 8 Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening of reporting of observational studies in epidemiology (Strobe) statement: guidelines for reporting observational studies. *Int J Surg*. 2014; **12**:1495–9.

Taylor & Francis  
Not for distribution