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REVIEW ARTICLE

The purpose, design and administration of a questionnaire for data collection

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Abstract This paper considers the use of questionnaires as a data collection tool. A range of issues will be discussed, including whether previously validated questionnaires already exist for utilisation, the advantages and disadvantages of employing questionnaires, optimum design features including the wording and language used and the ordering of questions, distribution methods, ways of maximizing response rates and managing non-responses, reliability and validity, the benefits of piloting the questionnaire and approval before the questionnaire is used. Questionnaire-based research is increasing evident within the NHS and elsewhere and from this presentation it is clear that a range of issues must be taken into account so that collected data can be gathered effectively in a format that can be appropriately used.
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Introduction

This paper aims to explain the purpose, design and administration of questionnaires. A questionnaire is a method of data collection which is completed by the respondent in written format.[1] It is a popular research instrument, but designing a questionnaire to yield high quality usable data and achieving a high return rate is not as easy as it may, at first, appear.[2] Indeed this needs careful planning and design[3] and an effective method of distribution. Questionnaires can be used on their own as the sole research instrument or in association with other research tools[2] e.g. objective measurements of image quality may be taken from radiographs after the injection of a drug, as well as asking patients about the side effects of the drug via a questionnaire. A questionnaire is a cost effective way to collect data, from large numbers of the population.[4] However, before opting for a questionnaire the research needs to be planned. The researcher must consult with the literature and experts in the field to decide what they need to know e.g. what are the research questions? Only then can it be decided whether a questionnaire is the most appropriate tool, which will provide the information required.[5] If in the planning and

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reviewing the literature phase it is found that little is known about a particular area, a qualitative approach is best used first e.g. a focus group (where respondents are assembled as a group to answer questions on the research area of interest).[1] Using the information gained it may then be appropriate to develop a questionnaire.[2]

Use of validated questionnaires

An important factor in searching the literature is to establish whether there are already validated questionnaires that explore the research topic.[2] If so, they should be used, as a questionnaire developed by a novice researcher is unlikely to have the reliability and validity of one that has been rigorously tested during the design phase. The use of a validated questionnaire will save time and resources, allow comparison with data derived from other studies and it may be easier to get the results published.[2] Books and articles[6–11] contain a wide range of validated scales pertaining to measuring health status, satisfaction with services and quality of life in health care settings. Another advantage of using validated scales is that some, e.g. Speilberger's State and Trait Anxiety Inventory,[12] give rise to interval or ratio data, the strongest data achieved by the use of a calibrated, validated scale, facilitating a robust parametric analysis.

Advantages of questionnaires

With careful planning, questionnaires can yield high quality usable data, achieve good response rates[3] and provide anonymity, the latter encouraging more honest and frank answers, than for example interviews. This can help to reduce bias.

A questionnaire is a useful data collection tool where the following conditions are met:

- the target audience, even if geographically spread, can be clearly defined and identified,
- the majority of respondents know what is asked of them,
- the focus of the analysis is numerical i.e. the questionnaire yields quantitative data.[4]

Disadvantages of questionnaires

Questionnaires, as other data collection tools, have certain disadvantages: they are unsuitable for subjects with poor literacy, visual impairment and non-English speakers unless translated; the researcher generally has no idea if the questionnaire was filled in by the respondent it was meant for; if there are confusions caused by the questionnaire the researcher cannot clarify these; there is little flexibility for respondents to present their own perspective on issues unless there are several open questions. Questionnaires can give rise to very poor response rates,[5,13] although careful planning, design and administration can increase this.[3,4] Without careful planning regarding the administration of the questionnaire, there can be recruitment bias. For example if the views of patients attending for MRI were sought, a notice could be put up in the department asking interested patients to ask for a questionnaire at the desk. The respondents, however, would only be highly motivated attenders and it would have been more representative to issue a questionnaire to every user or every tenth user on a particular day.[14]

Question types

Questions should be short and focussed, consisting generally of 12 words or less. However, when addressing sensitive or personal issues, longer less abrupt and threatening sentences are preferable.[2] The more structured the questions are, the easier they are for the researcher to interpret,[5] as the data produced will be quantitative i.e. information that is quantified and thus numerical.[1] To yield qualitative data i.e. non-numerical observations and narrative data[1] a high proportion of open questions must be asked. A range of question types exists and these are summarised below:

- *Open questions* are those where the expected response is in words. These questions should only be asked if the researcher is seeking narrative, qualitative information[15] e.g. if your decision not to attend for breast screening is not listed please give your reasons. Some sort of content analysis is required for the responses.[5] This involves analysing the responses in a systematic and objective fashion, usually to convert the information into data that can be quantitatively measured.[1]
- *Closed questions* are where a respondent is offered a choice of alternative replies e.g. did you travel to the hospital by car, taxi, bus, other. They are of various types.[5,13]
- *Quantity* where the response is a number e.g. how many times have you been scanned during this pregnancy?

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