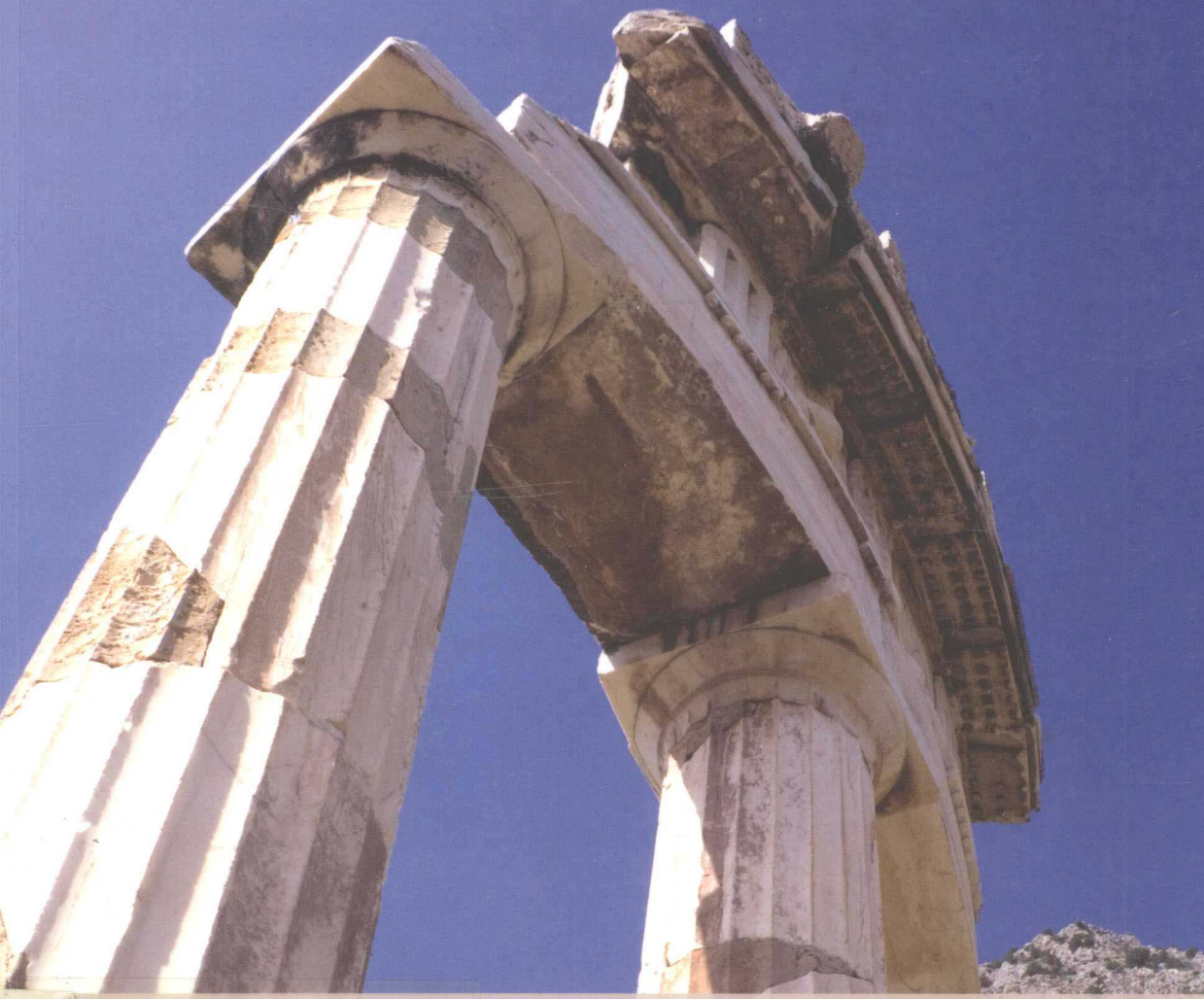
# The Delphi Technique in Nursing and Health Research



NEAD KEENEY | FELICITY HASSON | HUGH McKENNA

WILEY-BLACKWELL

# The Delphi Technique in Nursing and Health Research

**Sinead Keeney**

*Senior Lecturer, Institute of Nursing Research, School of Nursing, University of Ulster, UK*

**Felicity Hasson**

*Senior Lecturer, Institute of Nursing Research, School of Nursing, University of Ulster, UK*

**Hugh McKenna**

*Dean of Faculty of Life and Health Sciences, University of Ulster, UK*



WILEY-BLACKWELL

A John Wiley & Sons, Ltd., Publication

This edition first published 2011


Blackwell Publishing was acquired by John Wiley & Sons in February 2007.
Blackwell's publishing programme has been merged with Wiley's global Scientific, Technical, and Medical business to form Wiley-Blackwell.

*Registered office*
John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, United Kingdom

*Editorial offices*
9600 Garsington Road, Oxford, OX4 2DQ, United Kingdom
The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, UK
2121 State Avenue, Ames, Iowa 50014-8300, USA

For details of our global editorial offices, for customer services and for information about how to apply for permission to reuse the copyright material in this book please see our website at www.wiley.com/wiley-blackwell.



*Library of Congress Cataloging-in-Publication Data*
Keeney, Sinead.
The Delphi technique in nursing and health research/Sinead Keeney, Felicity Hasson, Hugh McKenna.
p. ; cm.
Includes bibliographical references and index.
ISBN 978-1-4051-8754-1 (pbk. : alk. paper) 1. Nursing–Research–Methodology. 2. Health–Research–Methodology. 3. Delphi method. I. Hasson, Felicity. II. McKenna, Hugh P., 1954- III. Title.
[DNLM: 1. Nursing Research–methods. 2. Delphi Technique. 3. Health Services Research–methods. 4. Research Design. WY 20.5]
RT81.5.K47 2011
610.73072–dc22

2010040520

A catalogue record for this book is available from the British Library.

Set in 9.5/12.5pt Palatino by Aptara® Inc., New Delhi, India
Printed and bound in Malaysia by Vivar Printing Sdn Bhd

1 2011

# Preface

*The Delphi Technique in Nursing and Health Research* is written as a guide for any students and/or researchers who wish to use this methodological approach. The aim of the book is to introduce the researcher to the 'Delphi', outline its historical development and serve as a manual to facilitate the use of the technique. Issues that a Delphi researcher must consider will be presented in a straightforward fashion by discussing in detail applications to research. The reader is taken on a step-by-step journey from the research question to choosing a sample through conducting and analysing data. For example, methodology and issues related to design typologies, sampling, instrumentation, methodological rigour and methods of data analysis are discussed. Parameters for the successful application of the Delphi and its variety of uses are analysed, using examples of real empirical investigations.

The technique's key characteristics, anonymity, use of experts and controlled feedback are examined. Furthermore, the specific role of the Delphi researcher will be explored in depth. The book provides the reader with the necessary information to participate in and conduct studies using the Delphi methodology. Brief case scenarios are presented for readers' consideration. In addition, key learning points are detailed at the end of each chapter along with an extensive and current annotated bibliography.

# Acknowledgements

This book is a collective creation and, as authors, we recognise the benefit from the support and labour of others.

Hugh acknowledges his wife, Tricia, his son, Gowain, and his daughter, Saoirse, whose patience and support know no bounds.

Felicity thanks her family for the support and encouragement they provided in the writing and production of this text.

Sinead thanks her husband, Declan, and her children, Niamh and Niall, for their unwavering support, belief and encouragement.

# Contents

# 1 The Delphi Technique

## Introduction

Most research studies are driven by research questions that need answering. To do so, the researcher must employ a research design. While there is little agreement among researchers as to the proper classification, Parahoo (2006) suggested that there are three types of research designs: experimental, case study and survey designs.

Experimental designs tend to be future oriented and the researcher often has to set up the conditions under which the investigation will take place. The most 'scientific' version of the experiment involving human subjects is the double-blind randomised clinical trial. It is employed widely in medicine in the testing of new drugs and is often referred to as the gold standard of research designs.

Case studies are in-depth investigations of phenomena. This type of design helps researchers gain an intimate knowledge of a person's or a group's condition, thoughts, feelings, actions both past and present, intentions and environment (Creswell, 2003).

Survey designs are by far the most common type used in health care research. This may be classified as descriptive, exploratory or comparative. The aim of a survey is to gather data from specific individuals, groups or populations for the purpose of addressing a particular issue. A more detailed overview of survey designs can be found in McKenna et al. (2006).

One type of survey that is gaining in recognition and popularity is the Delphi Technique and that is the focus of this book. This chapter will define and describe the technique, provide background as to its origins and outline the different types of Delphi surveys available to researchers. The characteristics of the Delphi will be outlined and there will be discussions on who can be categorised as experts, what constitutes a round, how feedback is handled and what is meant by anonymity and consensus. Finally, the Delphi will be compared with other consensus reaching methodologies including the nominal group technique and the consensus conference.

*The Delphi Technique in Nursing and Health Research*, First Edition, © S. Keeney, F. Hasson and H. McKenna Published 2011 by Blackwell Publishing Ltd.

## History of the technique

The desire for humankind to predict their future is an ongoing quest. Dating back thousands of years, oracles had a firm place in the life of Greeks and Romans. One of the most important oracles in the classical Greek world was at 'Delphi'. The Greek word *Delphois* refers to the womb indicating the Grandmother earth (Fontenrose, 1978). The name 'Delphi' is derived from the Oracle of Delphi. Delphi is an archaeological site in Greece on the south-western face of Mount Parnassus. In Greek mythology, Delphi was the location of the most important oracle in the classical Greek world, and a major site for the worship of the god Apollo. The god Apollo made himself master of Delphi, after slaying the dragon Pathos who protected the site, was also famous for his ability to foresee the future (Linstone, 1978). Legend has it that Apollo prophesies were transmitted through female intermediaries, known as *Pythia*, a name derived from the python, a source of wisdom in ancient Greece (von der Gracht, 2008). She had to be an older woman of blameless life chosen from among the peasants of the area.

In a state of trance, induced by vapours rising from a chasm in the rock, the Pythia (or priestess) would sit on a tripod over an opening in the earth and would communicate Apollo's answers to priests who would translate these back to the petitioners. People from far and wide consulted the Delphic oracle on a range of topics including important matters of public policy, to personal affairs, to the outcome of wars and the founding of colonies. Therefore, the term 'Delphi' has become synonymous with receiving good judgement on an issue.

The Delphi technique itself was developed at the beginning of the cold war to forecast the impact of technology on warfare (Custer *et al.*, 1999). In 1944, General Henry Arnold commissioned a report for the US Air Force on the future technological capabilities that might be used by the military.

Two years later, the Douglas Aircraft Company started Project RAND to study inter-continental warfare. Different approaches were tried, but the shortcomings of traditional forecasting methods, such as theoretical approaches, quantitative models or trend extrapolation, in areas where precise scientific laws have not been established yet, quickly became apparent. Similarly, exploring the use of focus groups to forecast events indicated three main problems including the influence of dominant personalities, noise and group pressure (Dalkey, 1969a).

To combat these shortcomings, the Delphi method was developed, essentially founded on the premise that individual statistical predictions were stronger than unstructured, face to face group predictions (Kaplan *et al.*, 1949). Entitled Project RAND during the 1950–1960s (1959) by Olaf Helmer, Norman Dalkey and Nicholas Rescher (Rescher, 1998) the Delphi

method started to develop. Initial application of the method required experts to provide their opinion on the probability, frequency and intensity of possible enemy attacks and the number of atomic bombs needed to destroy a particular target. This process was repeated several times until a consensus emerged.

Whilst Helmer and Dalkey developed the method, Abraham Kaplan, a qualified philosopher employed by the RAND Corporation, coined the name 'Delphi'. The founders of the method, however, were critical of the name 'Delphi'. As Dalkey (1969a, p. 8) explained:

> In some ways it is unfortunate – it connotes someone oracular, something smacking a little of the occult – whereas as a matter of fact, precisely the opposite is involved; it primarily is concerned with making the best you can of a less than perfect fund of information.

Nevertheless, since the Delphi's development, there has been a broadening of the technique and it is now commonly used across a wide range of disciplines including health, nursing and medical research. The use of the Delphi technique to identify research priorities and gain consensus in many areas of health research is clearly apparent (Edwards, 2002; Sowell, 2000; Palmer & Batchelor, 2006; Byrne *et al.*, 2008).

## What is the Delphi technique?

The main premise of the Delphi method is based on the assumption that group opinion is more valid than individual opinion. A novel and contemporary way of illustrating this is through the use of 'ask the audience' in the popular game show, *Who Wants to Be a Millionaire?*, where the audience effectively act as the 'expert panel', experts in general knowledge, and the contestant asks the audience for their opinion on a certain question. The audience is asked to vote on the answer using a keypad and the results displayed in a bar chart form showing where the consensus lies. Obviously, the use of the word 'expert' is used loosely here but this demonstrates the main premise of the Delphi Technique that group opinion is considered more 'valid' and 'reliable' than individual opinion.

## Defining the Delphi technique

The Delphi technique has been defined as a multi-staged survey which attempts ultimately to achieve consensus on an important issue (McKenna,

1994a). Prior to this, Dalkey and Helmer (1963) asserted that the Delphi was a method used to obtain the most reliable consensus of opinion of a group of experts by a series of intensive questionnaires interspersed with controlled feedback. In essence, all definitions agree that the purpose of the technique is to achieve agreement among a group of experts on a certain issue where none previously existed.

The original advocates of the Delphi Technique, Dalkey and Helmer (1963), defined the Delphi technique as 'a method used to obtain the most reliable consensus of opinion of a group of experts by a series of intensive questionnaires interspersed with controlled feedback' (p. 458). With increasing usage, broader definitions have been put forward. For instance, Reid (1998) believed that Delphi is a method for the systematic collection and aggregation of informed judgement from a group of experts on specific questions and issues.

Lynn *et al.* (1998) defined the Delphi technique as an iterative process designed to combine expert opinion into group consensus. Most definitions attempt to encompass or highlight the ever-adapting Delphi process in one sentence, which has resulted in broad and varying interpretations of the technique. Regardless of definition, as alluded to above the purpose of the technique is to achieve consensus among a group of experts on a certain issue where no agreement previously existed.

There are many differing forms of Delphi now in existence, such as the 'modified Delphi' (Rauch, 1979; McKenna, 1994a), the 'policy Delphi' (Crisp *et al.*, 1997), and the 'real-time Delphi' (Beretta, 1996). Few researchers now use a uniform method of the Delphi technique, and this has been heavily criticised since the emergence of modifications of the technique poses a threat to the credibility of the Delphi technique and the validity and reliability of the research findings (Sackman, 1975).

## The Delphi process

### *Original Delphi*

In its original form, the Delphi process consists of two or more rounds of questionnaires administrated by post to an expert panel. The first questionnaire asks the expert panel for their opinions on a certain issue or topic in an open-ended manner. These responses are then analysed by the researchers and sent back to the expert panel in the form of statements or questions. The expert panel rate or rank the statements or questions within the second questionnaire according to their expert opinion on the subject. Rounds continue until a consensus is reached on some or all of the items as required. Today, this is known as the Classical Delphi.

### *Idea generation*

This original approach sets the foundation for an idea-generation strategy to uncover the issues pertaining to the topic under study. To do this, the respondents, referred to as panellists or experts, are asked to put forward as many relevant issues as possible in Round 1. Once analysed, these responses act as a springboard for the rest of the Delphi process. Feedback from Round 1 is provided in the form of a second questionnaire and opinion is asked on the issues raised. Normally, in subsequent rounds each panel member is provided with their own responses as well as those of the other panellists or experts and he or she is asked to reconsider and (if they wish) change it in the light of other panellists' responses. This continues for subsequent rounds until consensus is obtained. This process is best described as multi-stage where each stage builds on the results of the previous one (Sumsion, 1998).

## Priority setting versus consensus

The Delphi technique is used for two main purposes within nursing and health research. Firstly, it is commonly used to set priorities, for example the identification of nursing research priorities. Nurses, academics and researchers could form an expert panel to identify research priorities for the nursing profession at present. There are a large number of studies that have been undertaken in this area across the world (e.g. French *et al.*, 2002; Griffen-Sobel & Suozzo, 2002; McIlfatrick & Keeney, 2003; Cohen *et al.*, 2004; Annells *et al.*, 2005; Back-Pettersson *et al.*, 2008; Grundy & Ghazi, 2009). This type of priority setting exercise can be useful for the profession or experts involved or for funders to prioritise what areas of research should be funded in the short, medium and long term.

The second main use of the Delphi technique is to gain consensus. This can be on any set of issues or ideas. The expert panel are asked to rank or rate items either generated by themselves within Round 1 of the Delphi, as in the Classical Delphi, or in a modified Delphi through the literature or the use of focus groups or interviews. A consensus level is set (e.g. 70%) and once the pre-determined percentage of the expert panel has come to agreement on the importance or position of the statement, it is said to have reached consensus. Consensus studies have been widely utilised in nursing and health research to date (e.g. Butterworth & Bishop, 1995; Beech, 1997; Graham *et al.*, 2003; Beattie *et al.*, 2004; Cornick, 2006; Ferguson *et al.*, 2008; Jorm *et al.*, 2008).

### *Non-consensus Delphi*

While it may not appear immediately relevant to nursing or health research, it is important to point out that not all Delphi's aim to reach

consensus. Traditionally, the method has aimed at gaining consensus but other Delphi's, such as the Policy Delphi, aim to support decisions by structuring and discussing the diverse views of the 'preferred future' (Turoff, 2006). The Argument Delphi, a derivative of the Policy Delphi (Kuusi, 1999), focuses on ongoing discussion and seeking relevant arguments rather than focusing on the output. The 'Disaggregative Policy Delphi' (Tapio, 2002) uses cluster analysis as a systematic tool to construct various scenarios of the future in the latest Delphi round.

## Types of Deplhi

### *How has the Delphi evolved?*

Since its inception the Delphi technique has evolved into a number of modifications (see Table 1.1). There are hundreds and possibly thousands of studies in the literature reporting on studies using these different manifestations, and this is tribute to the flexibility of the method.

The reason for these adaptations is based on the fact that there are no formal, universally agreed guidelines on the use of the Delphi. Its original form, known as the *classical Delphi*, involves the presentation of a questionnaire to a panel of 'informed individuals' in a specific field of application, in order to seek their opinion or judgement on a particular issue. After they respond, the data are summarised and a new questionnaire is designed based solely on the results obtained from the first round. This second instrument is returned to each subject and they are asked (in the light of the first round's results), to reconsider their initial opinion and to once again return their responses to the researcher. Repeat rounds of this process may be carried out until consensus of opinion, or a point of diminishing returns, has been reached. This illustrates the Delphi technique is a multi-stage approach with each stage building on the results of the previous one. Hitch and Murgatroyd (1983) saw it resembling a highly controlled meeting of experts, facilitated by a chairperson who is adept at summing up the feelings of the meeting by reflecting the participants' own views back to them in such a way that they can proceed further – the only difference is that the individual responses of the members are unknown to one another. A *classical Delphi* format was employed by McIlfatrick and Keeney (2003) with 112 nurses attending a cancer nursing research conference in Northern Ireland. The aim of this survey was for those attending to identify priorities for cancer research.

Nevertheless, it is widely used in a great variety of forms (Mead, 1991; Butterworth & Bishop, 1995; Green *et al.*, 1999) without adequate consideration of the consequences. For further reading of the numerous variations of formats of the Delphi, see Chien *et al.* (1984).