Evidence-based decision-making and practice is increasingly important in dental hygiene. Dental hygienists, along with other health professions, should be making clinical decisions based on evidence from sound research.\(^{1,2}\) Many clinicians are challenged, however, when searching for evidence for the types of questions that traditional quantitative research methods have not been able to investigate. There is a growing demand for qualitative methodology in health services research.\(^{3,4}\) Yet not all health professionals are comfortable with qualitative methods or how to use the knowledge derived from qualitative research.\(^{5}\)

Much has been written on qualitative research and methodology,\(^{6,7}\) and entire scholarly journals are dedicated just to the research methods. However, few dental hygienists read this literature. This obviously limits the range of evidence they can use to help improve health outcomes.\(^{8}\) Knowledge produced by qualitative studies can play a significant role in a practice that is evidence-based, particularly as social issues affecting health care are becoming increasingly complex.\(^{9,10}\) Yet, some researchers and clinicians call qualitative research “unscientific” either because they are not acquainted with its principles and research methods or because they do not realize its scientific value.\(^{11,12}\) Part of the problem is that the whole idea of science itself is never really challenged in the biomedical disciplines. Added to this is the fact that the research traditions used in the biomedical disciplines have only a weak relationship with the traditions used in the social sciences.\(^{13,14}\) As a result, some researchers and clinicians have a limited understanding of the social factors that influence health care.

In this paper, we provide a brief background on the basic differences between qualitative and quantitative approaches to research. Our aim is to challenge readers to examine common assumptions about science and research. We trace the historical development of the idea of science, followed by an overview of the basic tenets of qualitative research. We also provide examples from recent studies to highlight the type of evidence that qualitative research can produce.

**CHALLENGING TRADITIONAL IDEAS OF SCIENCE**

We give our own meanings to the words “knowledge,” “science,” and “research” and our interpretations are based on the assumptions that we make.\(^{15}\) The words “research” and “science” do not appear to be a problem, particularly if one is looking at them from a quantitative, empirical viewpoint—they relate to truth or facts that arise from what can be observed and measured. From this viewpoint, the word “science” conjures up images of laboratory experiments designed to discover universal truths about the world. Here, scientists attempt to test theories and cause-and-effect relationships through controlled experiments in controlled environments.

This, however, is quite a stereotypical and historically dominant view of science.\(^{16}\) It has dictated what science is, and what it can and cannot mean. As a result, we seldom, if ever, question the whole idea of science or how we develop our ideas of knowledge. We take for granted what we think we know about science and what it stands for.

But, take a moment to reflect on the following questions:

- Where does the idea of science come from and why do we do it?
- What makes a scientific project valid?
- What meaning can a scientist give to a phenomenon that those who are not scientists cannot give?
- What qualifies as knowledge in society?
- How do we know something?
- How is knowledge developed, transmitted, and maintained in social settings?
- What is the relationship between knowledge and the person who “knows” it?
- How do scholars and scientists identify knowledge?
- What might stand for the evidence that produces knowledge?
- How should this evidence be gathered and presented?
- Who decides what is true and what is false? Who decides what is real and what is fact or fiction? Who decides what is subjective and what is objective?

Scholars have argued about the “true” definition of science for a long time. Different camps have different philosophies of science: there are empiricists, positivists, functionalists, structuralists, feminists, relativists, interpretivists, constructivists, phenomenologists, realists, materi-
There has to be some form of “scientific” investigation of any occurrence or phenomenon if its resulting description is going to be valid and legitimate.

alists, and post-modernists, among many others. All claim to be doing “science”; all believe that their efforts are legitimate; and all uphold and promote the value of science. Yet, if we look at individual researchers within the different camps, we would find that each one is involved in essentially different activities, and that each has a significantly different view of what he or she does. Some tell “stories” from the “actor’s” perspective; others develop theories, laws, and rules of reality; and some use laboratories and clinics, while others use cultural spaces.

Nevertheless, all these different camps and researchers, whether experienced or novice, have a common belief: there has to be some form of “scientific” investigation of any occurrence or phenomenon if its resulting description is going to be valid and legitimate. To be legitimate, information has to be gathered, analyzed, and presented systematically within a specific scientific tradition. Some researchers carry out qualitative studies and others quantitative. Both types of researchers assume their work is a legitimate scientific activity. Both see their activities as a way of improving quality of life and of helping humanity in its pursuit of knowledge. Still, in some circles there is an ongoing debate as to which is the best way, which is truer to this cause, which is more legitimate and more appropriate.

Researchers who find themselves caught in such a debate need to reflect upon and examine more closely the assumptions that they bring to their work and how they respond to questions about reality, knowledge, bias, method, and language as these relate to the idea of science.

“TAKEN-FOR-GRAANTED” ASSUMPTIONS ABOUT RESEARCH

Most researchers realize that they bring a set of assumptions or a particular view of the world to their work. And these assumptions are themselves influenced by the way scientists answer the following basic questions about such things as what is real, what is knowledge, what is the role of bias and prejudice, what style of language they should use, and what research methods they should employ:

Consider the following questions:

1. What is reality? Is there one reality that remains the same regardless of who is looking at it? Or is it something that is based on interpretation?
2. What does it mean to know something? Is knowledge found through the senses (sight, touch, smell, hearing, taste), or is it established by interpreting information in its context from one’s own perspective?
3. Should researchers control for bias and prejudice, or are these an inevitable and fundamental part of experience? Whose values, truths, or ethics will prevail? Who is in power and who is at the margins?
4. Should language be formal and in the third person and essentially distant from the reader? Or should it be in the first person, with a closer bond with the reader? Should it evoke feelings or should it be impersonal? Which approach should prevail?
5. How should research proceed? What tools/instruments, if any, are necessary? Is a measuring stick required to count the frequency of occurrences, or is the researcher the instrument? Is data captured and displayed, or is information constructed and interpreted?

The way a person answers these questions shapes the way he or she views science. Given the biomedical background of dental hygiene, it is likely that many dental hygienists will favour quantitative approaches to research. However, concentrating exclusively on quantitative research limits one's access to all the knowledge that has been produced using different approaches in different disciplines and traditions, particularly those in the social sciences and humanities.

An appreciation of how ideas about science and knowledge have evolved in our society can help researchers and clinicians recognize the different views on what constitutes evidence as well as the assumptions that are brought to the research project.

TWO VIEWS OF SCIENCE

The scientific revolution (1500–1700) in Western Civilization introduced the idea of reason and the scientific method as the way to develop knowledge and truth.

The language of physics and mathematics was seen as pure, objective, and logical and as such, allowed scientists to “see” the truth. An example of one such tool was Galileo’s (1564–1642) telescope, which enabled the “seeing” of Copernicus’ theory that the sun was at the centre of the universe.

Science during this time was seen as a search for “pure” knowledge, free of the subjectivity, interpretation, or bias thought to result from social conditioning. Sir Francis Bacon (1561–1626) and René Descartes (1596–1650) called for the “certainty and self-evidence” of mathematics to explain how the universe “truly” functioned. John Locke (1632–1704) asserted that empiricism—the theory that all knowledge originates in the senses—is the only true way to come to know the world. Sir Isaac Newton (1642–1727) introduced the theory of gravity and the laws of motion that govern nature as it functions “perfectly and predictably.” The scientific revolution challenged the status quo and carved a path for the Enlightenment (1700–1789)—an intellectual movement credited with introducing scientific thought.
The 18th century also saw the establishment of social science, based on the principles of the Enlightenment. During this time, Henri Saint-Simon (1760–1825) popularized the term positivism (from the French words positive and system or theory). Positivists believe that truth and reason are permanent and are not affected by history and culture. They believe we could use rational, concrete principles to understand social interactions. Auguste Comte (1798–1857), considered the founder of modern social science, reaffirmed that true knowledge can be discovered and measured using scientific laws that had been established through controlled experiments and that could be demonstrated. The aim was to find the scientific laws that governed human beings and their behaviour. This is the Received View of science. It asserted that the truths of scientific theories are absolute and that observed facts exist regardless of personal views. This definition of science became so predominant in the 18th century that society came to accept its principles unquestioningly. The aim was to replace intuitive knowledge with scientific knowledge that could not be challenged or questioned.

Nevertheless, the Enlightenment’s concepts of science soon began to change within some circles. In his Critique of Pure Reason (1781), Immanuel Kant put forth the idea of human reason being the final judge of the origin of knowledge. He contended that we do not simply experience the world as it shows itself to us; we interpret it as well. This is the Revolutionary View of science. It states that science is deeply influenced by social forces and that interpretation (influenced by culture and the social environment) is deeply and undeniably embedded in science. Followers of this view argue that what people believe to be true will determine how they act in and interpret situations. Scientists in this camp maintain that a holistic approach to research has to include consideration of the social context of the problem.

**QUALITATIVE VERSUS QUANTITATIVE RESEARCH**

There is a seemingly endless debate over these two views of science—and which is more legitimate—and over qualitative versus quantitative research. Many researchers agree, however, that whatever perspective and research method is chosen—qualitative or quantitative—it must suit what is being studied. It is not uncommon to hear that the basic difference between qualitative and quantitative approaches is the way in which data are presented. As mentioned earlier, qualitative researchers report their findings through narrative accounts and conceptual frameworks rather than statistical generalizations and causal relationships. In other words, qualitative research questions tend not to ask how much; instead, they ask what, how, and why. Although, whether one counts or not is not the distinguishing factor here—qualitative researchers can and of course do count things. The distinction lies in the philosophy behind the research methods.

Results that can be measured and analyzed statistically are the aim of quantitative research. It is the social aspects and context of an event that are the focus of the qualitative researcher. Qualitative researchers will argue that we view the world through individual perspectives and contexts and therefore do not automatically experience events the same way as others. These perspectives and experiences are not easily measured but the qualitative researcher attempts to explore how people view a social event and what sort of meaning they take from it.

**FUNDAMENTALS OF QUALITATIVE RESEARCH**

Qualitative research allows interpretive and descriptive methods in studying human or social events. Researchers try to understand the nature, meaning, and content of social experiences; they explore people’s experiences, interpretations, and cultural viewpoints (including their own) in particular social contexts. The research questions deal with the “what,” “how,” and “why” of any particular occurrence and not with its size or quantity, that is, “how large” or “how many.” Qualitative health researchers are interested in questions such as, “What is the meaning of illness, disease, or health?” Using open-ended discussions and interviews, qualitative researchers study people’s accounts of events and focus on the complexity, variance, detail, and context of their experiences. These discussions, for example, can help researchers examine different ways of interpreting a particular event and give greater insight into people’s experiences and thoughts. This insight can help clinicians understand better why people behave the way they do.

The intent of qualitative research is not to count how many people hold a particular view or to determine the majority opinion; the information is not “managed” and analyzed in a way that allows this type of quantification. Qualitative research is not a science of immutable facts, figures, and generalizations. Instead, the qualitative method helps researchers explore the meaning and significance of an occurrence or event from the point of view of the participants in the study. It allows for a reflective description of many related viewpoints and accounts of what people experience and understand. This type of knowledge is useful, for example, when developing individualized and realistic patient care interventions and enhanced clinical care. It can provide a deeper understanding of human experiences and interpretations of such things as health, illness, and health services—all issues that affect the well-being of individuals and populations.
The qualitative method helps researchers explore the meaning and significance of an occurrence or event from the point of view of the participants in the study.

USING THE EVIDENCE FROM QUALITATIVE HEALTH RESEARCH

Qualitative research methods employ several different designs for collecting and analyzing data, chosen according to the research objectives. It is beyond the scope of this paper to describe and discuss each method, but we will provide a few examples of the types of questions that have been explored using qualitative research methods. We present three examples of recent studies found in dental and dental hygiene journals to show (1) the kind of qualitative studies researchers are engaging in; (2) the type of evidence generated by such studies; and (3) how it can be used to inform dental hygiene practice.33,34,35

The study of Maryland dental hygienists, conducted in 2002,33 used focus group interviews to gather in-depth information on dental hygienists’ awareness and opinions of oral cancer, oral cancer examinations, and related factors. The study was conducted to supplement the findings from a state-wide quantitative survey of Maryland dental hygienists on the same topic. The authors of this qualitative study indicate that the focus groups not only provided candid, in-depth information but also allowed for a detailed and more meaningful insight into the range of factors that influence the decision to provide oral cancer examinations on a routine basis. Research findings from qualitative studies that highlight the experiences of dental hygienists in clinical settings help other clinicians not only to consider how they may change their own practice toward enhancing the quality of care they provide but also to encourage practitioners to reflect more deeply on why they choose one type of treatment decision over another. The second study looked at adolescents’ perceptions of oral health and influencing factors.34 It was conducted using semi-structured interviews. The authors report that selecting participants strategically rather than randomly provided information of significant depth and breadth. The participants within the study provided a range of views on what they think about when it comes to their oral health. The script for the semi-structured interview included the following types of questions:

“Can you describe what you mean by oral health? I would like you to describe your own oral health in your own words. What do you think has influenced your current oral health? How do you think you can influence your oral health in the future? I would like you to talk a little about your family/your leisure time.”34 (p. 168).

The authors report that a qualitative method for collecting data allowed relaxed discussions and more probing questions; something that is not possible in a survey design. A greater insight into how patients understand, experience, and construct their world can help clinicians to appreciate why some people see and do things in one way and not another. This is particularly useful for planning more meaningful and individualized interventions.

The third qualitative study explored the knowledge, attitude, and behaviour of schoolchildren toward soft drinks and its relation to dental erosion. In this study, the authors conclude that useful information came out of the focus group research that could be explored further in a larger quantitative study. In this way, the findings could be generalized to a larger population. This type of study can provide the practising dental hygienist with a more detailed and relevant understanding of the different beverage choices of children and adolescents. This information can be incorporated into oral health education counselling to make it more meaningful and individualized.

These studies attempt to explore and explain how members of a particular social group construct their social realities and how they experience notions of health and illness. The findings can help clinicians design appropriate treatment and intervention plans for individualized, comprehensive care. Recognizing the assumptions about knowledge that underlie dental hygiene practice helps to determine how different types of available evidence can be used. This in turn provides the practising dental hygienist with a broader scope of evidence to draw on when making decisions for dental hygiene practice.

CLOSING CHALLENGE

Our aim for this article was to provide a basic introduction to qualitative research and the type of knowledge derived from qualitative studies that dental hygienists can use to respond to related clinical practice questions within an evidence-based framework.

Approaches used in qualitative research are a fundamental part of social sciences. However, this tradition of inquiry is relatively new in dental and dental hygiene research.36,37 Quantitative methods and randomized controlled trials are frequently referred to as the “gold standard” for evidence, even in studies of public health problems.38 But quantitative approaches are challenged to interpret the complex social, political, and economic factors that affect health. We know very little about these multifaceted social factors that affect issues in health care in general and oral health care in particular. This may be one reason why dental research has had a minimal impact on social, economic, and political issues affecting oral health care. Dental public health research places significant emphasis on the causal model when studying the determinants of health. This becomes a problem when studying social factors affecting health and health care.39

Evidence-based decision-making requires clinicians to ask specific questions, identify and become familiar with the resources that best answer the questions, and to perform a systematic strategy to gather additional information. An understanding of how qualitative research contributes to this process and the type of knowledge it can provide is critical to employing comprehensive clini-
Qualitative studies in health care can provide a significant insight into how social factors can influence the process of care and related health outcomes.