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REVIEW ARTICLE

From dental science to clinical practice: Knowledge translation and evidence-based dentistry principles

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Abstract It has been claimed that in order to decrease the gap between what we know and what we do, research findings must be translated from knowledge to action. Such practices better enable dentists to make evidence-based decisions instead of personal ideas and judgments. To this end, this literature review aims to revisit the concepts of knowledge translation and evidence-based dentistry (EBD) and depict their role and influence within dental education. It addresses some possible strategies to facilitate knowledge translation (KT), encourage dental students to use EBD principles, and to encourage dental educators to create an environment in which students become self-directed learners. It concludes with a call to develop up-to-date and efficient online platforms that could grant dentists better access to EBD sources in order to more efficiently translate research evidence into the clinic.

Contents

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1. Background

Knowledge translation (KT) concerns the application of the best available evidence to benefit health and well-being. This is a substantive process that involves a range of stakeholders who interact within the healthcare system (Salbach, 2010; MacDermid and Graham, 2009; Hassan, 2013). Evidence-based dentistry (EBD), on the other hand, is the process of combining the best available scientific evidence and the clinical expertise of dentists with patient needs and preferences in order to serve as the foundation for clinical care (Niederman et al., 2011; Ismail et al., 2004). It has been claimed that even busy dentists can easily implement EBD with the use of technology and electronic EBD resources (Gillette, 2008; Seals and Jones, 2003). EBD is particularly important in treatment planning, which is the process in which critical decisions toward patient care take place.

Evidence-based treatment planning in dentistry is meant to help clinicians provide the most contemporary treatment justified by the stronger reasoning following from a thorough review of alternative treatments, diagnostic information, patient desires and evidence-based outcome data (Anderson, 2000; Anon., 2009; Bidra, 2014; Seals and Jones, 2003; Kwok et al., 2012; Wood et al., 2004). Unfortunately, implementation of an evidence-based practice (EBP) by dentists is very limited due to its complexity. Therefore, this paper is intended to familiarize dental students and clinicians with KT and EBD concepts in order to promote their adoption on a daily-basis.

2. Knowledge translation

2.1. The Canadian Institutes of Health Research

In Canada, the main federal agency accountable for supporting financially health research is the Canadian Institutes of Health Research (CIHR). Part of its mandates is to excel in the establishment of novel health information and to translate that knowledge from the research setting into practice (Tetroe, 2007).

The first reason policy makers sought the need to include the process of KT to CIHR principles is that when innovative knowledge is generated, it is not necessarily likely to become widely adopted or make an impact on the health sector (Tetroe, 2007). In fact, only 14% of new research enters day-to-day healthcare practice (Westfall et al., 2007) and the implementation process may take between 17 (Balas et al., 2000) and 20 years (Ho et al., 2003). Another reason to pay attention to KT is that recently the emphasis on research governance and accountability from the government and the public has grown (Tetroe, 2007). According to Statistics Canada (Graham et al., 2007), roughly $700 million was spent on high-quality health research between 1988 and 2005 by CIHR. For example, despite billions of dollars spent on health research in North America, its healthcare systems often fail to implement cost-effective services (Grimshaw et al., 2012). In fact, for every $1 spent on new discoveries, about $0.01 is spent on disseminating information (Farmer et al., 2008). Moreover, the government and the public are eager to see the expected positive outcomes from taxpayers' money used in health research within real-world applications.

2.2. Knowledge translation definition

The concepts of KT, knowledge exchange, research utilization, implementation, diffusion, and dissemination are frequently confused and misunderstood (Graham et al., 2006). KT is specifically about turning knowledge into action and encompasses the processes of both knowledge creation and knowledge application (Graham et al., 2006). The most well-known definition of KT was given by CIHR (Tetroe, 2007) in 2000:

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