SCHWERPUNKT

Implementation science in healthcare: Introduction and perspective

Implementierungsforschung im Gesundheitswesen: Einführung und Ausblick

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Summary Implementation science is the scientific study of the methods to promote the uptake of research findings into routine healthcare in clinical, organisational, or policy contexts. The presence of gaps between knowledge and practice is well documented and a range of strategies is available to overcome these gaps. To optimize their impact, it is recommended that implementation strategies are tailored to the target population, setting and goals for improvement. Themes for future research in the field are: implementation of personalized medicine, the economics of implementation, knowledge implementation in various health professions, patient involvement in implementation, and a better understanding of the determinants of implementation. Addressing these challenges requires dedicated training programs, research funding, and networks for effective collaboration with stakeholders in healthcare.

Zusammenfassung Implementierungsforschung ist die wissenschaftliche Forschung der Methoden zur Förderung der Umsetzung von Forschungsergebnissen in der klinischen Praxis sowie organisatorischen und politischen Bereichen. Das Vorhandensein von Lücken zwischen Wissen und Praxis ist ausführlich dokumentiert, und es gibt eine Reihe von Strategien, mit denen sich diese Lücken schließen lassen. Um ihre Wirkung zu optimieren, ist es empfehlenswert, die Implementierungsstrategien auf Zielpopulation, Einstellungen und Ziele der Verbesserung zuzuschneiden. Themen für zukünftige Studien auf dem Gebiet sind: Implementierung der personalisierten Medizin, wirtschaftliche Aspekte, Implementierung in verschiedenen Gesundheitsberufe, Patientenbeteiligung und ein besseres Verständnis der Determinanten der Implementierung. Diese Herausforderungen erfordern spezielle Trainingsprogramme, Forschungsförderung und Netzwerke für eine effektive Zusammenarbeit mit den Akteuren im Gesundheitswesen.

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Introduction

It is well documented that not all patients receive recommended healthcare, and that some receive clinical or preventive interventions that are not indicated [1]. Likewise, not all managerial and policy decisions in healthcare are guided by the best available research knowledge. Variations in decisions and practices across patients, healthcare providers and geographic regions can help to identify in healthcare delivery. Practice variation can be interpreted in terms of knowledge-practice gaps, if the evidence on recommended practice is sufficiently strong. For instance, anti-platelet therapy has shown to reduce risk for cardiovascular events in patients with coronary heart diseases, but only 83% of 2960 patients with coronary heart disease from 10 countries received it [2]. Investments in basic and clinical research remain wasted if effective clinical or preventive interventions, medical devices or organizational models are not applied in practice. On the other hand, resistance to change is appropriate if it helps to preserve good practices [3].

Implementation science is the scientific study of the methods to promote the uptake of research findings into routine healthcare in clinical, organisational, or policy contexts [1,4]. In other words, it concerns the translation of research knowledge into practice. This translation has been referred to as T2, with T1 concerning the translation of basic science into clinical or preventive applications [1]. T2 is the focus of this contribution. Implementation science is based on the assumption that research findings, which were generated in a particular population and setting (e.g. clinical trial), can be generalized and applied to a similar population and setting elsewhere. It also assumes that this transfer of knowledge can be studied and developed in a scientific way, and that knowledge of implementation helps to improve health outcomes in patients and populations. The appropriate unit of implementation is the synthesised body of evidence, not a single study, as single studies can be highly misleading [1]. Traditionally, implementation science has focused on continuing education of physicians, which remains a crucial method for promoting the uptake of knowledge in practice. The range of implementation strategies has broadened substantially in recent decades and includes educational, organizational, financial, and regulatory interventions and policies.

The overall research questions in implementation science can be summarized as follows: (1) what knowledge from research needs to be made available for translation, and how is this best done? (e.g. what are high-quality clinical guidelines); (2) what are current knowledge-practice gaps and their determinants? (e.g. using quality indicators); (3) which strategies to enhance knowledge uptake are effective?; (4) how can large-scale and sustainable implementation of recommended practice be achieved? It should be noted that implementation science is known under different names, which partly reflect subtle differences in focus, such as knowledge translation and improvement science. Implementation science can be positioned simultaneously within clinical research and health services research. Like clinical research, implementation science has a strong focus on outcomes of interventions for patients. The interventions for enhancing uptake of recommended clinical interventions are often complex, so the measures in implementation research often include aspects of professional performance and organisational changes, which are related to patient outcomes. Implementation science may address the prevention of disease or health promotion in populations, in which case it can be positioned within public health. An interest in the organisation and processes of healthcare delivery is shared with health services research, which addresses a broader range of organisational and societal issues that are only indirectly linked to implementation science. The implementation of findings from health services research is one focus of implementation science, but so far most of implementation research has focused on the uptake of findings from clinical research and public health. It does not have unique research methods. Rather, a range of research methods from the population sciences is used, including cluster randomized trials, clinical audits, qualitative research, case studies, systematic literature reviews, and economic modelling.

Research evidence

The journal Implementation Science (www.implementationscience.com) and the Cochrane Effective Professional Practice and Organization of Care group (http://epoc.cochrane.org) are two important sources of knowledge in the field, but many other journals and groups have contributed to implementation science in healthcare. Several hundreds of randomized trials of implementation strategies have been published in medical journals as well as thousands of observational studies that are relevant to the field. Comprehensive overviews and summaries of research evidence are available [5]. Focusing on randomized trials of implementation strategies, such as professional education and clinical decision support, it can be concluded that these have variable and, on average, modest impact on professional performance and patient outcomes. For many strategies, these effects are in the range of 5 to 10% absolute change of relevant aspects of professional performance [5]. The outcomes of some widely used programs to improve healthcare, such as quality management programs, have rarely been examined in rigorous evaluation designs.

As an example, research on audit and feedback to healthcare professionals is presented in some more detail. Audit and feedback, for instance focused on prescribed medication or complications after surgical procedures, is one of the most widely applied methods for enhancing the uptake of knowledge in practice. It is also an important component of many quality improvement and accreditation programs in healthcare, so it has high practical relevance to understand the impact of this method. The most recent version of the Cochrane review on audit and feedback identified 140 randomized trials [6]. Looking at dichotomous aspects of professional performance, a median effect of 4.3% absolute change was found, albeit with high variation across studies (interquartile range: 0.5% to 16%). Cumulative meta-analysis of this body of evidence suggested that the average effect size has not changed in the previous decade, despite several dozens of new trials in recent years [7]. It was not possible to identify strong predictors of outcomes of audit and feedback, but low performance at baseline, verbal formats,