The is widely acknowledged. it is evident

Business, Decision Making

Thescientific community continuously produces research findings that cancontribute to more effective and efficient healthcare. However, to have aneffect on healthcare outcomes, these findings need to be adopted by healthcare systems, organisations and professionals (Eccleset al., 2009). Despite the considerable amount ofscientific knowledge produced, the implementation of research outcomes inclinical practice remained challenging and got little attention (Beroet al., 1998; Eccles et al.

, 2009). According to Green, Ottoson, García, & Hiatt (2009), it can take an average of 17 yearsfor generated knowledge to become implemented in routine clinical practice. Correspondingly, in spite of the rapid development of innovative eHealth technologies andthe growth in published research on eHealth showing positive results, akin toscientific knowledge in general, the dissemination and implementation of thesenew technologies in real-world healthcare settings remains difficult (Rabin & Glasgow, 2012; Varsi, 2016). This gap wasdescribed in a review by Elbert et al. (2014), which advocatedfor a shift in research from large controlled studies on effectiveness of eHealthtowards studies focussed on strategies to implement effective eHealthinitiatives in daily practice. The majority of published research showed to bemore concerned with efficacy and effectiveness, rather than analysing and evaluating how new interventions areimplemented (Elbert et al., 2014; Murray et al., 2011).

This gap between research, developmentand implementation is widely acknowledged. It is evident that there was, andstill is, a clear need for research addressing the uptake of research intopractice, namely implementation science. 1.

1 Defining implementation scienceIn itsbroadest sense, implementation means; tocarry into effect (OED, 2017). A moreoperational definition was given by Rabinet al. (2008), who stated that implementation isthe process of putting to use or integrating evidence-based interventionswithin a setting. Implementations science considers the determinants, processes, and results of implementation to understand what, why and howinterventions work in real-world settings (Peterset al., 2014). Eccles& Mittman (2006)define implementation science as: ” The scientific study of methods to promotethe systematic uptake of research findings and other evidence-based practicesinto routine practice, and, hence, to improve the quality and effectiveness ofhealth services”.

It isespecially concerned with the context in which implementation takes place, theusers of the new produced knowledge and (maintaining) behavioural change inorganisations and individuals (Eccleset al., 2009; Peters et al., 2014; Varsi, 2016). In the past two decades, implementation science has grown into a well-recognized body of science and isnow widely used to gain a better understanding of how to make use and implementnew eHealth interventions in practice (Eccleset al., 2009; Varsi, 2016).

3. 3 Implementation theoriesThere is a growing interest in the use of frameworks, models and theories for implementation studies (Nilsen, 2015; Sales et al., 2006; Tabak et al., 2012).

Some of thetheories used, have been previously applied in other disciplines such aspsychology and sociology, while others have emerged from inductive researchapproaches used within implementation science (Tabak et al., 2012;

Varsi, 2016). In a narrativereview, Nilsen (2015) distinguished fivecategories of theoretical approaches used in implementation science: processmodels, determinant frameworks, classictheories, implementation theories and evaluation frameworks. 1. Processmodels are aimed at describing and/or guiding the process of translatingresearch into practice (Nilsen, 2015).

Earlier processmodels, so-called research to practice models, characterized implementation asa linear process of production, diffusion and dissemination. However, as itbecame evident that the context in which research is used and implemented isfundamental, this view shifted to consider a broader spectrum of implementationaspects (Nilsen, 2015). Planned actionmodels, another type of process model, provide practical guidance toorganisations or individuals for the planning and execution of implementation (Lehman, Simpson, Knight, & Flynn, 2011; Nilsen, 2015). 2. To help understand and/or explain what factorsinfluence implementation outcomes, determinantframeworks describe general types of determinants that (are hypothesizedto) influence implementation outcomes (Nilsen, 2015). Many frameworks use a multi-level approachincluding determinants from individual, organisational and other levels thatare made up of various barriers and/or enablers (Nilsen, 2015; Varsi, 2016).

Determinants areoften derived from psychological theories on individual behaviour andorganisational theories on leadership and organisational culture (Nilsen, 2015; Tabak et al., 2012; Varsi, Ekstedt, Gammon, & Ruland, 2015). 3.

Classictheories refer to theories that have previously been appliedin other research fields (Nilsen, 2015). A widely adoptedclassic theory is Rogers' (2003) theory ofDiffusions of Innovations, which was first used in sociology. He described fiveattributes of innovation; complexity, relative advantage, compatibility, trialability and observability. According to Rogers (2003), these five factorsdetermine the diffusion of new ideas, products and practices in a populationthrough social systems. 4. Implementationtheories provide a deeper understanding and/or explanation ofcertain aspects of implementation (Nilsen, 2015). It supportsresearchers in prioritising the most important implementation features foranalysis.

The Normalisation Process Theory (NPT) by McEvoy et al. (2014) for example, identifies coherence, cognitive participation, collective action and reflexivemonitoring as the four main aspects of embedding complex interventions inpractice. 5. Evaluationframeworks provide structural approaches for the monitoring andevaluation of specific aspects of implementation initiatives to determineimplementation success (Nilsen, 2015). Evaluationframeworks also provide means to compare outcomes of complex interventions andmonitor implementation progress (Campbell et al.

, 2000; Nilsen, 2015). Given the five categories of theoretical approachesfor implementation research, the Consolidated Framework for ImplementationResearch (CFIR) was selected and used to guide this study. According to Nilsen (2015), the CFIR can becategorised under determinant frameworks, which is in line with this study'saim to identify the main barriers and facilitators of the PHC eHealth programmein South Africa.

Moreover, in a systematic review by Ross et al. (2016) on the factors thatinfluence eHealth implementation, the outcomes were said to fit the CFIRremarkably well and its domains were very well defined. The broad andcomprehensive nature of the framework allowed for a complete and detaileddescription of the implementation, covering all aspects of implementationwithout limiting the depth of the study. 1.

2 The Consolidated Framework for Implementation ResearchThe consolidated framework for Implementation research(CFIR) was introduced by Damschroder et al. (2009) and is increasinglybeing used in implementation research. The CFIR encompasses a set of generaldomains comprised of multiple constructs that are synthesized and consolidated from19 theories about innovation, dissemination, organisational change, knowledgetranslation, implementation and research uptake (Damschroder et al.

, 2009; Ilott, Gerrish, Booth,& Field, 2013). Themeta-theoretical nature of the framework allows it to be used in variouscontexts and acknowledges the multi-layered complexity of implementation (Damschroder et al., 2009; Ross et al., 2016). The includedconstructs are all believed to influence implementation either positively ornegatively. However, no distinction is made between the importance of differentconstructs and causal relationships are not specified, making it a descriptiveframework (Damschroder et al., 2009). The CFIR includesa total of 38 constructs divided under five major domains: interventioncharacteristics, outer setting, inner setting, characteristics of individuals, and process (Damschroder et al.

, 2009). Each domain isshortly explained below. An overview of all constructs by Damschroder et al. (2009) is attached (appendix 1). The first domain is focused on the characteristics ofthe intervention that is being implemented. It addresses the perceptions of keystakeholders on the origin, quality and validity of supporting evidence, costs, design and adaptability of the intervention. It also includes the complexityand relative advantage associated with the intervention. The clearer theunderstanding of the advantage of an intervention, the easier it is toimplement (Rogers, 2003).

According to theCFIR, interventions have core components (essential elements) and an adaptableperiphery (adaptable elements related to the intervention and its context). Adaptation is fundamental to avoid resistance to implementation oforganisations or individuals (Damschroder & Hagedorn, 2011). The outer setting describes the external determinantsthat promote the implementation of an intervention including policies andregulations, external mandates, and guidelines (Damschroder et al., 2009).

Competitivepressure for implementation, and patient needs are also taken in consideration. It generally includes the broader social, economic and political context inwhich an intervention is implemented (Damschroder et al., 2009; Varsi, 2016). With the PHCeHealth programme being a governmental initiative, the outer setting isbelieved to enable a better understanding of the effect of political incentiveson the implementation. The inner setting is mainly focused on the structuralcharacteristics, communication channels, culture, readiness formimplementation, and the overall implementation climate (Damschroder et al., 2009).

This includescompatibility, learning climate and leadership engagement. According to Damschroder & Hagedorn (2011), this is arguablythe most complex domain because of the dynamic and interrelated nature ofelements within organisations. A good understanding of the organisationalstructure in which an intervention is introduced is essential to be able totake into account the multiple levels at which barriers and facilitators may beof influence (Damschroder et al., 2009; Varsi et al., 2015).

Characteristics of individuals describe the attitudesof involved stakeholders, self-efficacy, motivation, values and competences. Individualsare not simply passive receivers of new innovations, they have agency, and caninfluence themselves or others which may have consequences for implementation (Damschroder et al., 2009). This domain isespecially concerned with the knowledge, beliefs and skills of the individualsinvolved, as the effect of their interests, norms, values and mindset on theimplementation process should not be underestimated (Damschroder et al.

, 2009; Varsi, 2016). The final domain, process, describes the practicalelements related to the implementation process, such as the planning, executionand evaluation. It also addresses the engagement of stakeholders, includingopinion leaders and champions which are involved in decision making and/orpromoting implementation (Damschroder & Hagedorn, 2011). A high-qualityimplementation plan for example, comprising clear phases or distinct steps, increases the chance of successful implementation.

The process domain can referto multiple processes and sub-process running sequentially or simultaneously atmultiple levels (Damschroder et al., 2009). Multiple reviews have shown that the CFIR (figure 3)is suitable and most frequently used to identify barriers and facilitators forthe implementation of an innovation during or post implementation (Kirk et al., 2016; Ross et al., 2016).

While theframework is often solely used to guide data analysis, early adoption of theframework during research question formulation and data collection strengthens thisresearch and the applicability of its finding (Damschroder & Hagedorn, 2011; Kirk et al., 2016; Ross et al., 2016).