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TRADUÇÃO DO CONHECIMENTO E SUA APLICAÇÃO NA ATENÇÃO PRIMÁRIA À SAÚDE

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KEITTY REGINA CORDEIRO DE ANDRADE

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Tese apresentada para a obtenção do Título de doutora em Ciências Médicas, pelo Programa de Pós-Graduação em Ciências Médicas da Universidade de Brasília.

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“O importante não é o conhecimento;

mas, o uso que dele se faz”

(Talmude)

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LISTA DE ABREVIATURAS E SIGLAS

CFIR – *Consolidated Framework for Implementation Research*

CRD – Centre for Reviews and Dissemination

CINAHL – *Cumulative Index to Nursing and Allied Health Literature*

EMBASE – Excerpta Medical dataBASE

HSE – Health Systems Evidence

IC 95% – Intervalo de confiança de 95%

I^2 – i-quadrado (medida de inconsistência entre os estudos)

KT– knowledge translation

LILACS – Literatura Latino-Americana e do Caribe em Ciências da Saúde

NICE – Nacional Institute for Health and Care Excellence Evidence Search

NPT – Normalization Process Theory

OMS – Organização Mundial da Saúde

PRESS – Peer Review of Electronic Search Strategies

RE-AIM –Reach, Efficacy/Effectiveness, Adoption, Implementation, Maintenance

RP – Razão de prevalências

SciELO – *Scientific Electronic Library Online*

SUS – Sistema Único de Saúde

TDF – Theoretical Domains Framework

TPB – Theory of Pplanned Behavior

RESUMO

Introdução: Apesar de existirem evidências científicas que detalham tratamentos e condutas eficazes, como diretrizes e revisões sistemáticas, muitas vezes procedimentos baseados em evidências não são utilizados pelos profissionais de saúde e pelos gestores desses sistemas, o que leva à implementação de tratamentos ou à gestão inadequadas. Este fato reflete a lacuna existente entre a pesquisa e a prática e a resposta para este dilema encontra-se na área de tradução do conhecimento. Esta tese está dividida em três capítulos e versa sobre a tradução do conhecimento no contexto da atenção primária à saúde.

Objetivo: Descrever as características metodológicas e a eficácia das estratégias de tradução do conhecimento no cenário da atenção primária à saúde.

Métodos: O trabalho foi estruturado em três artigos com metodologias distintas, a saber: 1) um estudo teórico-reflexivo, com o intuito de discutir a incorporação da tradução do conhecimento na saúde pública do Brasil, 2) uma revisão de escopo, para mapear e descrever características metodológicas dos estudos de implementação e, 3) uma overview de revisões sistemáticas, para analisar estratégias para tradução do conhecimento no cenário da atenção primária à saúde. Os estudos foram elaborados obedecendo aos critérios essenciais de relato e qualidade metodológica conforme o tipo de estudo. Compreendeu busca exaustiva nas principais bases de dados e literatura cinza, e o processo de seleção, extração e avaliação de qualidade metodológica dos estudos incluídos foi realizado independentemente por dois revisores, e em casos de discordância por um terceiro revisor.

Resultados: O primeiro capítulo da tese apresenta avanços e desafios importantes a serem superados no Brasil no processo de traduzir o conhecimento científico para a prática. Investir em estudos pilotos para adaptar intervenções efetivas para o cenário brasileiro pode ser uma alternativa, bem como aumentar a capacitação de pesquisadores brasileiros no delineamento e avaliação de estudos de implementação. No segundo capítulo, constata-se que os estudos de implementação devem indicar claramente a prática baseada em

evidências a ser implementada, conceituar e justificar o modelo usado para apoiar a escolha da intervenção e informar o delineamento do estudo, bem como as variáveis a serem mensuradas. O terceiro capítulo indica pequenos efeitos de estratégias de tradução do conhecimento usadas na atenção primária como auditoria e feedback, visita educacional, lembretes e líderes de opinião.
Conclusão: A tese de doutorado traz uma contribuição teórica e metodológica à tradução do conhecimento no contexto da atenção primária à saúde no Brasil, a fim de ser útil para o planejamento de futuros estudos de disseminação e implementação a serem realizados no País.

Palavras-chave: ciência da implementação, atenção primária à saúde, revisão de escopo, overview, saúde pública

ABSTRACT

Introduction: Although there are chemicals that detail and manipulate methods such as systematic methods and analysis, procedures are often used by health professionals and managers of these systems, or lead to procedures or inadequacies. This fact reflects the gap between research and practice and the answer to this dilemma lies in the area of knowledge translation. This is divided into three chapters and deals with translation of knowledge in the context of primary health care.

Objective: To describe how methodological characteristics and the effectiveness of knowledge translation strategies in the primary health care setting.

Methods: The work was structured in three articles with different methodologies, namely: 1) a theoretical-reflexive study, aiming to discuss the incorporation of the translation of knowledge in public health in Brazil, 2) a scoping review, to map and describe methodological characteristics of the implementation studies and, 3) an overview of systematic analyzes to analyze knowledge translation analyzes in the primary health care setting. The studies were designed according to the essential criticisms and the methodological quality according to the type of study. It comprised the exhaustive search in the main databases and gray literature, and the process of selection, extraction and evaluation of the methodological quality of the studies used, performed precisely by two reviewers and in cases of disagreement by another reviewer.

Results: The first chapter presents important advances and challenges to be overcome in Brazil in the process of translating scientific knowledge into practice. Investing in pilot studies to effective adapt effective studies to the Brazilian scenario may be an alternative, as well as increase the capacity of Brazilian researchers to design and evaluate implementation studies. In the second chapter, it is noted that the application studies should clearly indicate the practice of use in implemented devices, conceptualize and justify the model used to allow the choice of interventions and information or study design, as well as the variables of measured use. The third chapter indicates small effects of knowledge

translation strategies used in primary care, such as audits and feedback, educational visits, reminders, and opinion leaders.

Conclusion: The doctoral thesis brings a theoretical and methodological contribution to the translation of knowledge in the context of primary health care in Brazil, in order to be useful for the planning of future dissemination and implementation studies to be conducted in the country.

Keywords: implementation science, primary health care, scoping review, overview, public health.

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APRESENTAÇÃO

Os sistemas de saúde dos países em desenvolvimento tendem a desconsiderar as evidências científicas no seu processo de tomada de decisão. Apesar de existirem evidências científicas que detalham tratamentos e condutas eficazes, como diretrizes e revisões sistemáticas, muitas vezes procedimentos baseados em evidências não são utilizados pelos profissionais de saúde e pelos gestores desses sistemas, o que leva à implementação de tratamentos ou à gestão inadequadas [1,2].

Tal fato reflete a lacuna existente entre a pesquisa e a prática, seja clínica ou gestora, conhecida pelo termo de *know-do gap* [3]. Como consequência dessa lacuna, pode haver repercussões na qualidade de vida da população e no uso ineficiente dos recursos de saúde, que já são limitados. Portanto, torna-se emergente a redução desse hiato a fim de melhorar os desfechos e os serviços de saúde, fortalecer os sistemas, e com isso garantir mais efetividade na promoção, prevenção e atenção à saúde [1,2,4].

A resposta para este dilema encontra-se na área de tradução do conhecimento *(knowledge translation*, KT) [5], pois abrange a problemática da lacuna entre o conhecimento existente sobre um determinado assunto e as condutas de saúde atuais. A tradução do conhecimento [1] é definida como um processo dinâmico e interativo que inclui a síntese, a disseminação, o intercâmbio e a aplicação do conhecimento, dentro de um complexo sistema de interações entre pesquisadores e usuários. Para tanto, são aplicadas estratégias que incluem uma variedade de intervenções destinadas a alterar o comportamento (manejo clínico ou gestão, por exemplo), que deve estar alinhado às recomendações baseadas em evidências. No contexto da saúde pública, tais estratégias devem ser usadas para promover a tomada de decisão informada por evidências [4,5].

A presente tese aborda a tradução do conhecimento e sua aplicabilidade na atenção primária à saúde. Foram realizados três artigos com metodologias distintas: estudo teórico-reflexivo, uma revisão de escopo e um *overview* de revisões sistemáticas. As pesquisas foram estruturadas na forma de artigo científico tradicional, sendo apresentadas nos capítulos 1, 2 e 3. A redação dos

manuscritos foi orientada por guias de relatos específicos aos delineamentos empregados [6,7]. Os artigos 2 e 3 estão apresentados na língua inglesa, uma vez que foram submetidos a revistas científicas internacionais, visando maior disseminação da pesquisa.

O capítulo 1, intitulado **"**Tradução do conhecimento na realidade da saúde pública brasileira", faz uma reflexão teórica dos avanços e desafios da incorporação da tradução do conhecimento no Brasil. No artigo, aborda-se as atividades básicas da tradução do conhecimento e elenca-se desafios e perspectivas no cenário brasileiro.

No capítulo 2, Artigo 2. Features of Implementation Studies in Primary Health Care: a scoping review, são detalhadas as características comuns entre os estudos de implementação no contexto da atenção primária. Nesse capítulo pretendeu-se resumir os esforços empreendidos para investigar o tema no mundo. Academicamente, o capítulo foi planejado para trazer maior conhecimento dos métodos usados nos estudos de implementação, de modo a embasar futuras pesquisas de campo sobre a temática no Brasil.

O capítulo 3, intitulado "Effectiveness of knowledge translation strategies for use in primary health care: an overview of systematic review" são apresentadas as estratégias de tradução do conhecimento aplicadas ao contexto da atenção primária. Esperou-se, nesse capítulo, identificar na literatura técnicas utilizadas internacionalmente para transferência de conhecimento da academia para a prática clínica.

A tese de doutorado pretendeu trazer uma contribuição teórica e metodológica à tradução do conhecimento no contexto da atenção primária à saúde no Brasil, a fim de ser útil para o planejamento de futuros estudos de disseminação e implementação a serem realizados no País.

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OBJETIVOS DA TESE

Esta tese tem os seguintes objetivos:

- Discutir a incorporação da tradução do conhecimento na saúde pública do Brasil.
- Mapear estudos de implementação na atenção primária à saúde e descrever suas configurações metodológicas.
- Identificar estratégias eficazes para tradução do conhecimento no contexto da atenção primária à saúde.

Estes três objetivos são assunto dos próximos três capítulos.

CAPÍTULO 1 - TRADUÇÃO DO CONHECIMENTO NA REALIDADE DA SAÚDE PÚBLICA BRASILEIRA

RESUMO

O termo tradução do conhecimento tem sido utilizado para descrever o processo de aplicar os resultados de pesquisa no mundo real, com o intuito de potencializar a qualidade e a eficácia dos serviços e cuidados de saúde. O objetivo deste artigo é discutir a incorporação da tradução do conhecimento na saúde pública do Brasil. No artigo, aborda-se as atividades básicas da tradução do conhecimento e elenca-se desafios e perspectivas no cenário brasileiro. O Brasil começou a caminhar no entendimento do processo de traduzir o conhecimento científico para a prática. Investir em estudos pilotos para adaptar intervenções efetivas, assim rotuladas em outros países, para o cenário brasileiro pode ser uma alternativa. Aumentar a capacitação de pesquisadores brasileiros no delineamento e avaliação de estudos de implementação é relevante para a melhoria deste campo no País.

Descritores: ciência da implementação; disseminação de informação; tradução do conhecimento; saúde pública

1.1 INTRODUÇÃO

A aplicação de resultados de pesquisas na vida real é um desafio que permanece no mundo contemporâneo [1]. Tradicionalmente, muitos anos decorrem para implementar um novo conhecimento, o que torna difícil a inovação na prestação de serviços de saúde, resulta em ineficiência dos sistemas de saúde e impacta na qualidade de vida da população [2]. Face a essa dificuldade, surgiram esforços para que as evidências sejam efetivamente compreendidas e implementadas nas práticas de saúde [3].

Não há consenso entre os termos usados para descrever esses esforços[4]. Utilização da pesquisa (*research utilization)*, ciência da implementação (*implementation science),* tradução do conhecimento (*knowledge translation*), transferência de conhecimento *(knowledge transfer)* e mobilização do conhecimento *(knowledge mobilization)* são expressões frequentemente empregadas [4-6]. Há ainda a sugestão de uso do K* (k*nowledge star)* [7]. Neste artigo utilizaremos tradução do conhecimento por ser o termo mais adotado mundialmente [8].

Alguns países de renda média e baixa têm avançado na compreensão e na execução de estratégias para tradução do conhecimento [9]. E no Brasil? Quais os obstáculos e avanços da tradução do conhecimento? Utilizam-se resultados das pesquisas para formular diretrizes para práticas, políticas e programas? As diretrizes para a prática, as opções para políticas e programas são implementadas? Tais indagações motivaram a elaboração desse artigo que tem o intuito de discutir conceitos que contribuem para descrever algumas das complexidades que influenciam a tradução do conhecimento para a saúde pública no Brasil.

1.2 O QUE É A TRADUÇÃO DO CONHECIMENTO?

Tradução do conhecimento é um dos termos usados para descrever a ciência de colocar a evidência em ação e de entender como as práticas baseadas em evidências funcionam no mundo real. Trata-se de um processo interativo que inclui a síntese, a disseminação, o intercâmbio e a utilização do

conhecimento com a finalidade de melhorar serviços e colocar à disposição da população produtos eficazes, e assim fortalecer o sistema de saúde. A tabela 1 apresenta os elementos que compõem uma definição de tradução do conhecimento e suas respectivas descrições [7,9].

Existem numerosos modelos propostos para representar os componentes necessários para a tradução do conhecimento [10]. Os aspectos comuns entre eles se concentram na sugestão de ultrapassar os moldes tradicionais de divulgação dos novos achados [11]. A figura 1 ilustra uma rotatória do conhecimento, análoga a uma rotatória de trânsito, onde o fluxo contínuo de tráfego ao redor da ilha central abrange fases dinâmicas para uso da evidência. Representa a ideia do conhecimento em movimento, que ao ser sintetizado e transferido é, presumidamente, melhor implementado pelos usuários.

Embora a tradução do conhecimento interaja com uma série de atividades, que inclui prática de saúde baseada em evidências, educação médica continuada, desenvolvimento profissional contínuo e melhoria da qualidade, pode ser entendida como algo mais amplo que todas elas. Envolve múltiplos fatores presentes nos diferentes níveis do sistema de saúde, os quais influenciam a maneira como as evidências são usadas por partes envolvidas na tomada de decisão [11]. As atividades para tradução do conhecimento podem não ser sequenciais e iniciar em qualquer fase do processo. Essas fases são a seguir delineadas.

1.2.1 Geração da evidência

Essa geração é representada pelos estudos individuais primários, ou seja, os relatos em primeira mão dos resultados de pesquisa. Em geral, eles ainda não estão prontos para serem transferidos para a prática, embora sejam imprescindíveis para apoiar pesquisas futuras. Estudos randomizados e observacionais controlados são exemplos desses estudos de primeira geração.

1.2.2 Síntese da evidência

A síntese consiste em compilar os resultados de pesquisas individuais para determinar o que é conhecido sobre o tema. Na área da saúde, os tipos mais comuns são as revisões sistemáticas com ou sem metanálises [12].

1.2.3 Transferência da evidência

A transferência diz respeito à transmissão do conhecimento ao potencial usuário. A comunicação é fundamental e fronteiras culturais e linguísticas interferem no processo. Pelo menos dois aspectos podem ser identificados, a difusão e a disseminação da evidência. A difusão refere-se à distribuição da informação, geralmente por meios tradicionais como publicações em periódicos, apresentação em conferências, e atividades diversas baseadas na web (por exemplo, postagens, blogs)[13].

A disseminação amplia a comunicação da informação por adaptar a mensagem para um público-alvo específico [13]. Inclui métodos ativos e direcionados como atividades diversas baseadas em arte (por exemplo, desenvolvimento de videoclipes, podcasts, dramaturgia) e uso de disseminadores do conhecimento (pessoas que se apropriam das evidências e as promovem dentro de sua própria organização ou em outros ambientes) [14].

1.2.4 Implementação da evidência

A implementação concentra-se em estratégias utilizadas para adotar e integrar intervenções baseadas em evidências, e entender como elas funcionam em determinados cenários. Enfatiza a importância da validade externa (ou seja, o grau em que os resultados de um estudo podem ser generalizáveis e relevantes para populações diferentes daqueles em que os estudos originais foram realizados) e da escalabilidade (ou seja, ampliação das práticas baseadas em evidências para beneficiar mais pessoas e populações)[15,16]. A tabela 2 apresenta os principais componentes da implementação [17].

1.3 DESAFIOS E PERSPECTIVAS DA TRADUÇÃO DO CONHECIMENTO NO CENÁRIO BRASILEIRO

O estudo do tema no Brasil apresenta dificuldades que são comuns a países de baixa e média renda. Essas dificuldades se relacionam à realidade local, caracterizada por baixo nível de infraestrutura e pouco engajamento das pessoas para traduzir evidências em práticas, políticas ou programas [18]. Há também a restrita interação entre pesquisadores e tomadores de decisão em saúde.

Há numerosos impasses na área da saúde para a transferência e a utilização de uma nova descoberta. Um dos grandes obstáculos refere-se à debilidade da cultura de pesquisa no âmbito do Sistema Único de Saúde (SUS). A interação entre produtores e usuários do conhecimento deve ser mais estimulada a partir da identificação dos problemas de saúde, pois facilita que as agendas de pesquisa sejam relevantes para aquele contexto.

Existem iniciativas com intuito de identificar as necessidades nacionais e regionais de saúde e aumentar a indução seletiva de temas para a produção relevante do conhecimento, por exemplo, o desenvolvimento da Agenda Nacional de Prioridades na Pesquisa em Saúde (ANPPS) [19]. É relevante sistematizar o processo de definição de prioridades de pesquisa em saúde, a fim de tornar esse processo mais transparente e de estimular a participação de gestores públicos, profissionais de saúde, políticos e comunidade civil nessa construção [19].

O Brasil dispõe de dados secundários coletados de diversas formas por sistemas de informação e inquéritos [20]. São evidências locais valiosas para auxiliar a tomada de decisão. No entanto, o uso desses dados é limitado devido às habilidades restritas de análise crítica e interpretação das evidências pelos decisores em saúde. Além disso, ao analisar uma base de dados, compreender o que as informações não respondem é tão importante quanto o que elas podem esclarecer. E como a quantidade de informação faltante é, na maioria das vezes, maior do que a disponível, é necessário fazer as perguntas certas. Disseminadores do conhecimento poderiam exercer um papel de provedores de evidências e assim, auxiliar a tomada de decisão informada por evidências, na área clínica ou na gestão de serviços [21].

Argumenta-se que as agências nacionais financiadoras de pesquisas necessitam avançar no apoio à estudos para disseminação e implementação do conhecimento produzido. Dessa maneira, poderiam promover o avanço da prática de tradução do conhecimento no campo da saúde pública [22].

A falta da institucionalização do uso de evidências é uma dificuldade a ser superada. A Organização Mundial de Saúde tem estimulado o uso de evidências em processos decisórios de saúde. Uma das iniciativas foi a criação de uma plataforma de tradução do conhecimento chamada Rede de Políticas Informadas por Evidências (do inglês *Evidence-Informed Policy Network* – EVIPNet, https://www.who.int/evidence/en/). Essa iniciativa repercutiu no Brasil. A EVIPNet Brasil elabora sínteses de evidências para políticas de saúde e promove diálogos deliberativos para discussão dos resultados das sínteses[23].

Usar síntese de evidências é parte do processo de tradução do conhecimento que auxilia o processo decisório, mas não é suficiente por si só para garantir a tomada de decisão informada por evidências [24]. Interesses políticos e econômicos dificultam esse processo [25] e a presença de lideranças institucionais, que valorizem o uso de evidências, facilitam a sua adoção [26]. No Brasil, a aplicabilidade da tradução do conhecimento se diferencia em função da peculiaridade da gestão do sistema em três esferas de decisão. Com a municipalização, cada gestor administra um sistema local de saúde com poder discricionário, ou seja, o gestor tem liberdade de escolha, pautada na conveniência a oportunidade, para basear ou não sua decisão em evidências.

Outro desafio a ser superado está na transferência do conhecimento, ou seja, na adaptação da mensagem principal em produtos que sejam facilmente assimilados por diferentes públicos. Neste sentido, algumas ações foram desenvolvidas no cenário brasileiro, por exemplo: os protocolos clínicos e diretrizes terapêuticas (http://www.saude.gov.br/protocolos-e-diretrizes), o portal da Atenção Primária a Saúde (https://aps.saude.gov.br/), a comunidade de práticas da atenção básica (https://novo.atencaobasica.org.br/), e o Centro Cochrane Brasil (https://brazil.cochrane.org/). Contudo, a maioria dessas ações é voltada para a difusão.

Espera-se o avanço em estratégias de disseminação de evidências que considerem as diferenças culturais do Brasil. Por exemplo, a transferência do conhecimento no Nordeste pode ser realizada através de cordel, a depender da

questão envolvida. Além disso, os pesquisadores poderiam ser encorajados a apresentar planos para tradução do conhecimento como parte de suas propostas de subsídios e aperfeiçoar a comunicação dos resultados de suas pesquisas para o público em geral ou estabelecer parcerias com profissionais de comunicação e designer gráfico [27].

Existem diferentes estratégias para tradução do conhecimento, no entanto, a maioria foi proposta e avaliada em países desenvolvidos [28]. As características comuns para o sucesso dessas técnicas incluem um forte treinamento ou elemento de capacitação, que considere o contexto cultural, político e econômico e encoraje uma abordagem colaborativa entre pesquisadores e tomadores de decisão [28].

Há maior facilidade para implementar pesquisas quando se recebe treinamento sobre uso de evidências [29]. Uma iniciativa brasileira para sensibilizar e capacitar gestores sobre o uso de evidências foi a criação de um curso de especialização em política informada por evidências (ESPIE), promovido pelo Ministério da Saúde. Esse exemplo poderia ser expandido de modo a beneficiar todo o País.

A implementação de evidências em saúde pública no Brasil está avançando lentamente, principalmente porque ainda não existe um quadro suficiente de cientistas e profissionais com a capacidade apropriada. Faz-se necessário aumentar a capacitação dos epidemiologistas sobre tradução do conhecimento, a fim de contribuir efetivamente para a integração das evidências na prática, pois estão entre os principais geradores de evidências. A epidemiologia pode impulsionar a implementação, ao fornecer evidências sobre intervenções efetivas, bem como informar métodos, indicadores de impacto e delineamentos dos estudos de implementação [30].

1.4 CONSIDERAÇÕES FINAIS

O Brasil começou a caminhar no processo de aplicar o conhecimento científico na vida real. Investir em estudos pilotos para adaptar ao cenário brasileiro intervenções de tradução do conhecimento efetivas em outros países, pode ser uma alternativa. Aumentar a capacitação de pesquisadores brasileiros no delineamento e avaliação de estudos de implementação é relevante para a melhoria deste campo no País.

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FIGURA

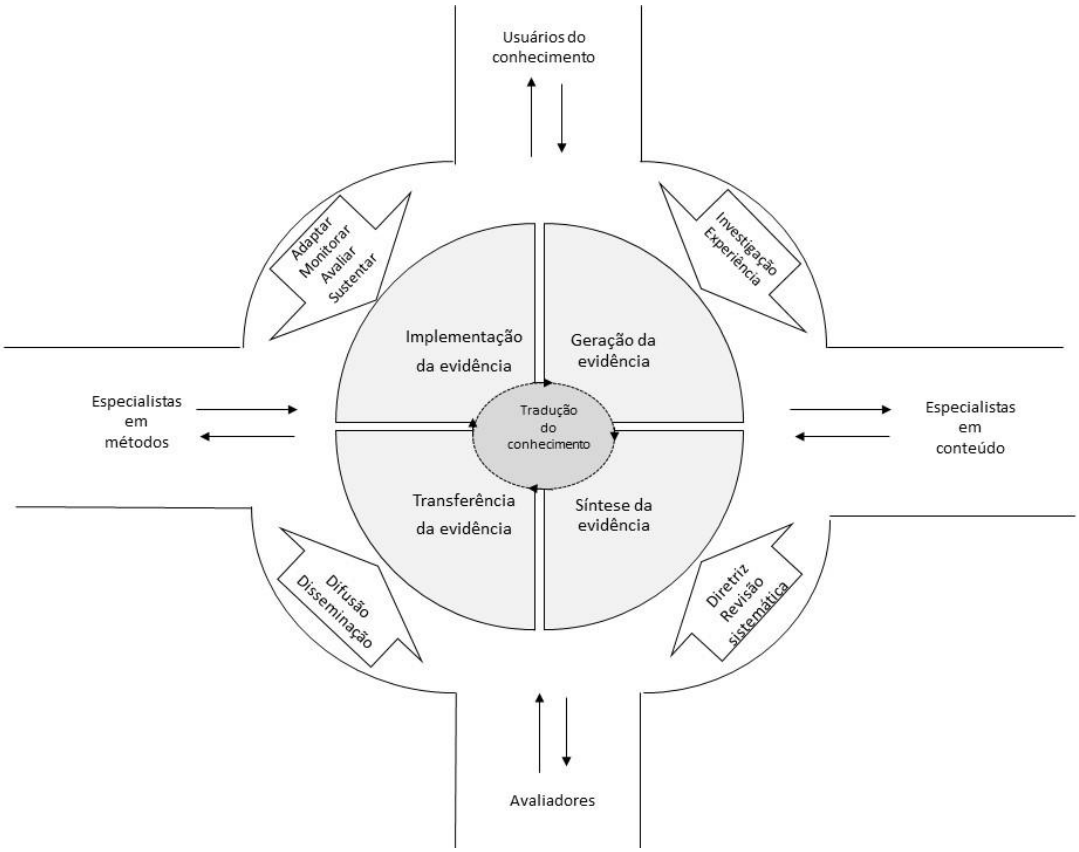

Figura 1. Rotatória da tradução do conhecimento. O fluxo contínuo de tráfego ao redor da ilha central representa as atividades para a tradução do conhecimento que podem iniciar em qualquer fase do processo. São elas: *geração da evidência*, compreende os estudos primários imprescindíveis para apoiar as pesquisas futuras*; síntese da evidência*, compila os resultados de estudos primários para determinar o que é conhecido sobre um problema e interpretá-los no contexto da evidência global; *transferência da evidência*, emprega estratégias de difusão ou disseminação do conhecimento ao potencial usuário; *e implementação da evidência*, utiliza métodos para adotar intervenções baseadas em evidências, e entender como e por que elas funcionam em determinados contextos. Os veículos que entram e saem da rotatória representam a interação entre os produtores e usuários do conhecimento que fornecem informações ao longo do processo. Envolver as pessoas no momento e no lugar certo é essencial para garantir o sucesso da tradução do conhecimento.

TABELAS

Tabela 1. Elementos que compõem a definição de tradução do conhecimento e suas respectivas descrições

Elementos do conhecimento	Descrição
Síntese	Contextualização e integração dos resultados de pesquisas individuais sobre um tema
Disseminação	Transferência do conhecimento por meio da identificação do público-alvo, personalização da mensagem e definição dos melhores meios de comunicação
Intercâmbio	Interação entre produtores e usuários do conhecimento com o intuito de aprendizagem mútua por meio de parceria ativa para solucionar um determinado problema
Aplicação	Uso do conhecimento na vida real por meio de atividades consistentes com princípios éticos e culturais, bem como estruturas legais e regulamentares

Tabela 2. Principais componentes da implementação de evidências

Etapas	Descrição
Identificar um problema	Analisar criticamente a literatura sobre um problema, bem como identificar lacunas no conhecimento que justifiquem a implementação prática
Adaptar o conhecimento ao contexto local	Revisar a produção do conhecimento, levando em conta validade, utilidade e adaptação de resultados para determinada situação, grupo ou indivíduo
Avaliar barreiras para uso do conhecimento	Compreender as dificuldades à assimilação e à aplicabilidade do conhecimento, bem como estratégias para superar tais barreiras
Selecionar, adaptar e implementar intervenções	Planejar e executar intervenções baseadas em evidências que promovam a implementação do conhecimento
Monitorar o uso do conhecimento	Avaliar se o conhecimento foi adequado para determinado grupo, e ainda se há novas barreiras a serem consideradas
Avaliar os resultados	Determinar o impacto do uso do conhecimento nas práticas em saúde ou no sistema público
Sustentar o uso do conhecimento	Planejar a disseminação e a ampliação do uso do conhecimento. Avaliar se o novo conhecimento continua a ser usado além da implementação inicial

ANEXO

Anexo 1. Comprovante do aceite de publicação do artigo 1

Revista de Saúde Pública - Decision on Manuscript ID RSP-2019-2073.R1
José Leopoldo Ferreira Antunes <onbehalfof@manuscriptcentral.com>
Ter, 29/10/2019 10:26
Para: keittyregina@hotmail.com <keittyregina@hotmail.com>
29-Oct-2019

Dear Dr. Andrade:

It is a pleasure to accept your manuscript entitled "Tradução do conhecimento na saúde pública: desafios e perspectivas no cenário brasileiro" in its current form for publication in the Revista de Saúde Pública.

Thank you for your fine contribution. On behalf of the Editors of the Revista de Saúde Pública, we look forward to your continued contributions to the Journal.

Sincerely,
Dr. José Leopoldo Antunes
Editor-in-chief, Revista de Saúde Pública
leopoldo@usp.br

CAPÍTULO 2 - FEATURES OF IMPLEMENTATION STUDIES IN PRIMARY HEALTH CARE: A SCOPING REVIEW

ABSTRACT

Objective: To identify implementation studies in primary health care and to describe their methodological configurations.

Methods: This is a scoping review that through the main databases and gray literature sought implementation studies in primary health care. There was no restriction on the status, year or language of publication. Screening, full reading and data extraction were performed by two researchers independently.

Results: Thirty studies were included that described and analyzed different contexts and aspects of the implementation of research in primary health care. Most of the included articles were published between 2018 and 2019 and were mainly focused on the implementation of recommendations for the management of noncommunicable chronic diseases in primary care. Common characteristics of implementation studies were evidence-based practice, theoretical justification, stakeholder engagement, strategy for implementation, study design and measurement.

Conclusion: The findings of this review highlight common frameworks in implementation studies and may provide guidance to public health researchers. The implementation study in the context of primary care should clearly indicate the evidence-based practice to be implemented, conceptualize and justify the model used to support the choice of intervention and inform the study design, as well as the variables to be measured. It is also necessary to involve stakeholders in research to ensure the feasibility of implementation.

Keywords: implementation science, primary health care, scoping review

2.1 INTRODUCTION

The need to understand the factors that determine the successful acceptance of innovation in primary care services, where there is a plethora of evidence-based preventive, diagnostic and management interventions, is recognized. This challenge exists in all health sectors but is especially challenging in primary care because of its inherent complexity and breadth [1].

This fact reflects distance between research and practice, whether clinical or managerial. As consequence of this gap, there may be repercussions on the population's quality of life and inefficient use of health resources. Therefore, the narrowing of this hiatus is emerging in order to improve health outcomes and services, strengthen systems, and thereby ensure more effectiveness in health promotion, prevention and care [2].

The answer to this dilemma lies in implementation research, commonly defined as the study of methods to promote the adoption and use of evidence-based interventions in practices, programs and policies to improve quality of care[3]. The implementation studies in primary health care (PHC) are based on the premise that quality of care and population health improve when research results are translated into practical applications [4].

In this context, this article aims to identify implementation studies in the context of primary health care and describe their methodological configurations.

2.2 METHODS

This is a scoping review [5]. The protocol of this review was registered *a priori* and is available upon request to the authors. The study was described according to the recommendations of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews-PRISMA-ScR Checklist [6] (Appendix 1).

2.2.1 Eligibility criteria

Studies that addressed methods of implementing any evidence-based practice in the context of PHC, outpatient clinics, family medicine departments, and community settings were included. Implementation of research was considered as processes and factors associated with the integration of evidence-based interventions into specific scenarios. Only articles from peer-reviewed publications or reports from government agencies and donor organizations were eligible for inclusion.

Studies that did not report evidence-based practice used for implementation, studies that focused on the health system in general without stratifying findings for PHC and studies that used research implementation methods without results of the processes performed or integrated with other sectors were excluded. Policy strategies, consensus statements, guidelines, summaries or conference procedures, protocols, letters, editorials or comments were also excluded.

2.2.2 Search strategy and information sources

The literature search for eligible studies was performed on February 22, 2019 and updated on October 30, 2019 using the following electronic databases: Center for Reviews and Dissemination, Cochrane Database of Systematic Reviews, Embase, Epistemonikos, Health Evidence, Health Systems Evidence, Latin American and Caribbean Health Science Literature, National Institute for Health and Care Excellence Evidence Search, PDQ Evidence, PyscINFO, PubMed, RX for Change, Scielo, Scopus and Web of Science. In addition, gray literature was also searched.

The search strategy was developed by one researcher (KRCA) and independently reviewed by another researcher (AMA) through the Checklist Peer Review of Electronic Search Strategies (Appendix 2). This tool evaluates items such as search query translation, the use of Boolean operators, topics related to the search theme, spelling of terms, and filters to expand or narrow the search [7].

After validation, the strategy was applied to PubMed, and slightly modified for the other databases (Appendix 3). Due to the numerous terms used to describe implementation research [8], manual searches were also performed at

Implementation Science and BMC Health Services Research. In addition, citation tracking and referencing were conducted for all included studies to find potential eligible studies.

2.2.3 Study selection

After removal of duplicates, title and abstract screening were performed. The team calibrated the eligibility criteria with a random sample of titles and abstracts selected by two independent researchers (KRCA, AMA). Two calibration exercises, with 50 records at a time, were required for the team to reach 90% agreement. Disagreements were resolved by consensus among the reviewers. The full text reading followed similar parameters with the calibration of 15 random articles. For ineligible studies, the main reason for exclusion was documented.

2.2.4 Data extraction and methodological quality assessment

Two authors (KRCA, AMA) independently extracted data from the selected studies and entered them into an online spreadsheet designed for this purpose. In cases of disagreement, the decision was taken by consensus. Validation of data extraction from eligible studies with their authors was done by email with a reminder through ResearchGate (Appendix 4).

The following data were extracted: first author, year of publication, country, research objective, type of study, target population, sample size, implementation status, evidence-based practice, stakeholder engagement, research design, theory used (model or structure) or implementation strategy.

Scoping reviews are not intended to produce a critically evaluated outcome for a question and are intended to provide an overview or map of evidence [9,10]. For this reason, there was no risk assessment of bias of the included evidence.

2.2.5 Summary of results

A descriptive synthesis of the results was performed. Tables and figures were elaborated to facilitate the visualization of the data. In the early stages of the review, Endnote X9 reference management software (EndNote, Thomson Reuters) was used to compile research citations and remove duplicates and Rayyan [11] for screening study eligibility. Data extraction and descriptive synthesis were performed by Excel (Microsoft Corporation, USA). The VOSviewer software (2019, version 1.6.13, University of Leiden) was used to build cluster analysis to represent the most frequent keywords in the published literature on PHC implementation studies.

2.3 RESULTS

2.3.1Study selection

The bibliographic search obtained 3,252 records. After evaluating the titles and abstracts, 83 articles were selected to read the full text. A total of 30 articles met all eligibility criteria [12-41]. Figure 1 illustrates the study selection process and Appendix 5 presents the excluded articles and reasons for their removal.

2.3.2 Bibliometrics

Considering all authors of the included articles, the countries with the largest number of authors are the United States, Canada, and the United Kingdom (Table 1). Most of the first authors of the included studies were linked to a university [12-32,35,39], followed by the World Health Organization [34,37,38], government agencies [33,36], such as Ministries of Health and non-governmental organizations [41].

The most frequent journal of publication was Implementation Science[17,18,23,24,28,30,36]. The Figure 2 presents the grouped view of the most frequent keywords in the titles and summaries of implementation studies in the context of primary health care.

In total, 61 terms appeared 3 times or more in titles or summaries related to the PHC implementation study. For example, "implementation research" appeared 21 times; “Evidence-based medicine” appeared 12 times, “primary care” appeared 9 times, “public health” appeared 8 times and “cardiovascular disease” appeared 5 times. Thus, the terms or phrases associated with the implementation were divided into six groups. From the results of co-occurrences, the studies were mainly focused on the implementation of recommendations for the management of noncommunicable chronic diseases in primary care.

2.3.3 Main features of the included studies

The main data from the included studies are described in Table 2. Year of publication ranged from 2007 to 2019, but a third of the studies were published in 2018 through October 2019. Most studies were conducted in the United States [13,14,17,20,21,27,29,35,38], followed by Canada [23,24,30,33,41] and the United Kingdom [12,15,18,26,40].

The studies included in this review have under-specification or lack of details of methodological configurations. Well-constructed tables, logical models, and figures that reflect the main concepts and analytical plan were absent in most studies. However, some features were common among surveys, namely:

2.3.3.1 Objective of the studies

The research questions of the included studies varied depending on the focus of implementation. The overall research objective of the majority (73.1%) of the studies was to gain a thorough understanding of practitioners' experiences (eg implementation processes, barriers and implementation facilitators) in implementing innovation [13,25,28,30-39,41].

2.3.3.2 Evidence-based practice and stakeholder engagement

The studies investigated the implementation of a wide range of innovations (eg health service delivery and process redesign, quality improvement, health promotion and disease management). Some studies have described methods

and experiments for implementing research results without specifying a condition [17,23,29,31,35,41].

The management of noncommunicable chronic diseases (such as choices of therapeutic alternatives, decisions about drug administration, treatments or medical interventions) [13,14,16,18,19,21,22,24,25-27,30, 32-34,37-39] were the most explored practices for the implementation process, followed by care service or counseling for depression [28], antibiotic distribution [15], melanoma [40], vertigo [36], human immunodeficiency virus (HIV)[20] and tuberculosis [12].

Almost 60% of the studies addressed implementation interventions and the rest were concerned with barriers and facilitators for implementation activities without providing details or description of the process. The studies were aimed primarily at doctors. Other stakeholders actively involved in implementation initiatives in the studies included researchers, nurses, therapists, managers, social workers, specialists, pharmacists and patients.

2.3.3.3 Theoretical justification

There were a number of implementation theories used. The Consolidated Framework for Implementation Research (CFIR) [42] was the most widely applied theoretical model among studies followed by the Framework Reach, Efficacy / Effectiveness, Adoption, Implementation, Maintenance (RE-AIM) [43], Theory Planned Behavior (TPB) [44], Normalization Process Theory (NPT) [45], Theoretical Domain Structure (TDF) [46] and Interactive Systems Structure [47]. However, fourteen studies did not report the theory used (Table 3).

2.3.3.4 Studies designs

The studies were predominantly of qualitative approach [21,25,27,29-31,33,34,36,39-41], followed by quantitative studies [12,14,17-20,22,24,28,35,38] and mixed methods studies. [13,15,16,23,26,32,37]. A wide range of data collection methods were used in all studies. Qualitative methods included interviews with key informants and focus groups with program managers or participants[21,27,31,33,34,36,37,39-41]. A combination of interviews and focus groups were used in seven studies [13,15,16,26,29,30,32] and cluster randomized studies in six [12,14,17,19,22,28]. Reports of

implementation periods and follow-up duration were inconsistent. Forty-nine percent of the studies described follow-up data and the period ranged from one week to five years.

2.3.3.5 Implementation strategy

The strategies adopted in the studies consisted of various educational approaches (eg, distribution of printed materials, educational meetings, educational visits) and various additional strategies, including reminders, audit and feedback, knowledge broker and local opinion leaders.

Sometimes research results have shown that certain key actors in society, such as health professionals, are lacking in information and training. In these cases, initiatives were necessary regarding the provision of this information and training [32,38].

2.4 DISCUSSION

The results of this review indicate an expansion in the number of articles from 2007. This trend is most evident in the increase in the number of countries with authors dealing with this theme, especially between 2018 and 2019. However, developing countries occupy a modest position.

There is a checklist to assist in reporting implementation studies[48]. However, the studies included in this review have under-specification or lack of details of methodological configurations. Still, some features were common such as the evidence-based practice description, the theoretical rationale for the study, and the implementation strategy.

2.4.1 Interpretation and generalization

Regarding the study objective, it is noted that instead of focusing on the cause of the increased number of cases of a specific disease, an implementation study may focus on a clear gap in providing evidence-based practices for dealing with the disease [49,50]. Investigators may also study why few providers adopt

evidence-based treatments [51] or why evidence-based treatments or programs have limited reach or adherence to a care system [52].

A common feature in implementation studies has to do with the practice to be implemented and its evidence base regarding effectiveness. Although the nature of the evidence is important, the implementation study prioritizes the importance of the context for this evidence, the external validity. Understanding the generalization of evidence and the context in which it has been shown to be effective may help in deciding the appropriate evidence-based practice to implement [53].

Many areas of science do not require stakeholder engagement [54], but in implementation studies involvement is a necessity as they can more easily identify implementation needs and challenges and thus develop viable and sustainable solutions [55]. Stakeholders and researchers can create different types of collaborative relationships [56]. Scholars describe three different approaches, namely: community-driven, involved in the dissemination of results; community-based, participate in the selection of research topics, but the researcher makes the final decision about the study design; and community-oriented, involves stakeholder participation in all aspects of the research [57,58].

In this review, it was observed that the theory has been little underused and unspecified in the implementation studies. The absence of theoretical justification in implementation research may limit the ability to specify key contextual variables and identify the precise mechanisms by which implementation strategies exert their effects[59].

Generally, the research seeking generalizable knowledge should be oriented and propose tests of conceptual frameworks, models and theories. In implementation science, models serve not only to inform which variables are relevant to measure and analyze, but also to inform the development or selection of an evidence-based practice or intervention, as well as the development or selection of a strategy for implement this intervention [60].

There is no consensus on the criteria that select the most appropriate theory for implementation studies [59]. However, a review of implementation science identified numerous models that were characterized by construct flexibility (how loosely or rigidly are the concepts defined in the model), (eg individual, organization, community, system) and the degree to which they

addressed dissemination versus implementation processes [61]. While many models of implementation science show considerable overlap, very few articles help researchers demystify the literature landscape. This can cause confusion when determining which model and which instruments to use[62,63]. Several authors have produced invaluable syntheses of conceptual models and theories that researchers may find useful [64-71].

There are varieties of designs developed and used in implementation studies. These include experimental (eg, randomized controlled study, cluster randomized controlled study), quasi-experimental (eg pre / post, interrupted time series), non-experimental or observational (eg surveys), mixed methods (eg the collection and integration of qualitative and quantitative data), and qualitative methods (eg focus groups, semi-structured interviews) [72].

Some scholars indicate a tendency to use the mixed method in implementation studies to increase context specificity, as well as allow convergence, complementarity or expansion of results obtained from the combination of qualitative and quantitative research[72]. There are other scholars who indicate hybrid studies that simultaneously test the effectiveness of the intervention and its implementation [73].

The selection the appropriate study design for an implementing scientific research depends on the research question and available evidence, as well as the circumstances of the study, such as the feasibility of randomization. For example, if the study question addresses how implementation occurs, a design that includes qualitative assessment may be required. If study participants do not accept randomization, a quasi-experimental design may be indicated [72].

The self-report was the most commonly used method for obtaining data in implementation surveys. The use of self-report makes sense as it captures the perceptions of the individuals involved. Moreover, the advantages of self-report are numerous, namely that they seem relatively pragmatic in the absence of existing observation infrastructure [74], and self-report tools reveal significant predictors of implementation outcomes such as adoption and fidelity. The disadvantages of self-report methodology are often overlooked[75].

Self-referral is prone to prejudice such as leniency and even an individual's mood [76]. For example, a meta-analysis suggests that although self-report measures and implicit measures of attitudes are related, factors such as social

desire, individual's degree of introspection and spontaneity of responses to the instrument affect the degree of the relationship. Studies showed that for some important implementation outcomes, such as adherence to innovation to innovation, self-reporting tends to provide an overestimation of the actual use of practice compared to observation [77]. In summary, caution should be exercised when using self-report versus independent observation, administrative data, etc.

Another relevant point is the selection of the implementation strategy. In this study, there were several implementation strategies and many lack detailed descriptions of the techniques used to ensure or enhance the adoption, implementation and sustainability of an evidence-based practice. [78] Strategy selection should be conceptually justified, based on models and frameworks that describe critical implementation elements. The theory should be used to explain the mechanisms by which implementation strategies are proposed to exert their effects and it may be useful to clarify such proposed mechanisms of change by developing a logical model illustrated in figure [79,80].

In addition to being theory-based, implementation strategies should be multifaceted or multilevel (if appropriate); robust or easily adaptable; feasible and acceptable to stakeholders; convincing, marketable, experientable and observable; sustainable; and scalable [81], it is also imperative that researchers recognize the complexity of implementation processes. One must be prepared to evaluate, adjust and adapt in an ongoing process that includes exchange and feedback among intervention developers, service system researchers, organizations, providers and consumers [82].

One review identified 73 distinct strategies grouped into categories, eg developing stakeholder engagement (planning), training practitioners to deliver an intervention (education), modifying incentives (funding), reviewing professional roles (restructuring), performing auditing and feedback (quality management)) and create accreditation standards (considering the political context) [78].

Implementation outcome measures should be included, conceptually justified, well defined and informed by existing measurement instruments, and should cover concepts of internal and external validity. Unlike the results of a more traditional epidemiological study, which usually measures clinical outcomes or changes in health status, the scientific implementation study requires specific

measurement of the constructs related to key implementation outcomes (eg, awareness, acceptability, scope , adherence, adequacy, feasibility, reliability, cost and sustainability) [83].

Unlike effectiveness studies, implementation research often involves some adaptation of an intervention to fit the local context; therefore, measurement needs to address the degree of intervention versus fidelity packaging [84]. For example, in a study of implementing human papillomavirus (HPV) vaccination in a resource-poor environment, the question is not just whether vaccination is effective in reducing the risk of cervical cancer, but also whether the vaccination program was adopted (measure adherence rate), implemented (measure the dose and full rate) or sustained (see if they continued to vaccinate 12 months after program initiation).

2.4.2 Strengths and limitations

The search strategy was comprehensive however, it is possible that it did not reach all the studies on the subject. We consulted many literature sources and specific journals in implementation science to reduce this limitation. The sparse literature related to the proposed objectives, sub specification and lack of details of the methodological configurations were important challenges in the development of this study. There was no evaluation of the quality of the included studies. It is generally not part of a scope review due to an effort to maintain a broad perspective and include studies with different methods and models [5].

2.5 CONCLUSION

The potential of implementation research is undermined by insufficient reporting. The findings of this review highlight common frameworks in implementation studies and may provide guidance to public health researchers. The implementation study should clearly indicate the evidence-based practice to be implemented, justify the model used to support the choice of evidence-based intervention and to inform study design as well as the variables to be measured.

It is also necessary to involve relevant actors in research to ensure the feasibility of implementation.

Future research can assess the extent to which tailored interventions have positive impacts on health outcomes and their acceptability and satisfaction for the population of interest.

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2.8 CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

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FIGURES

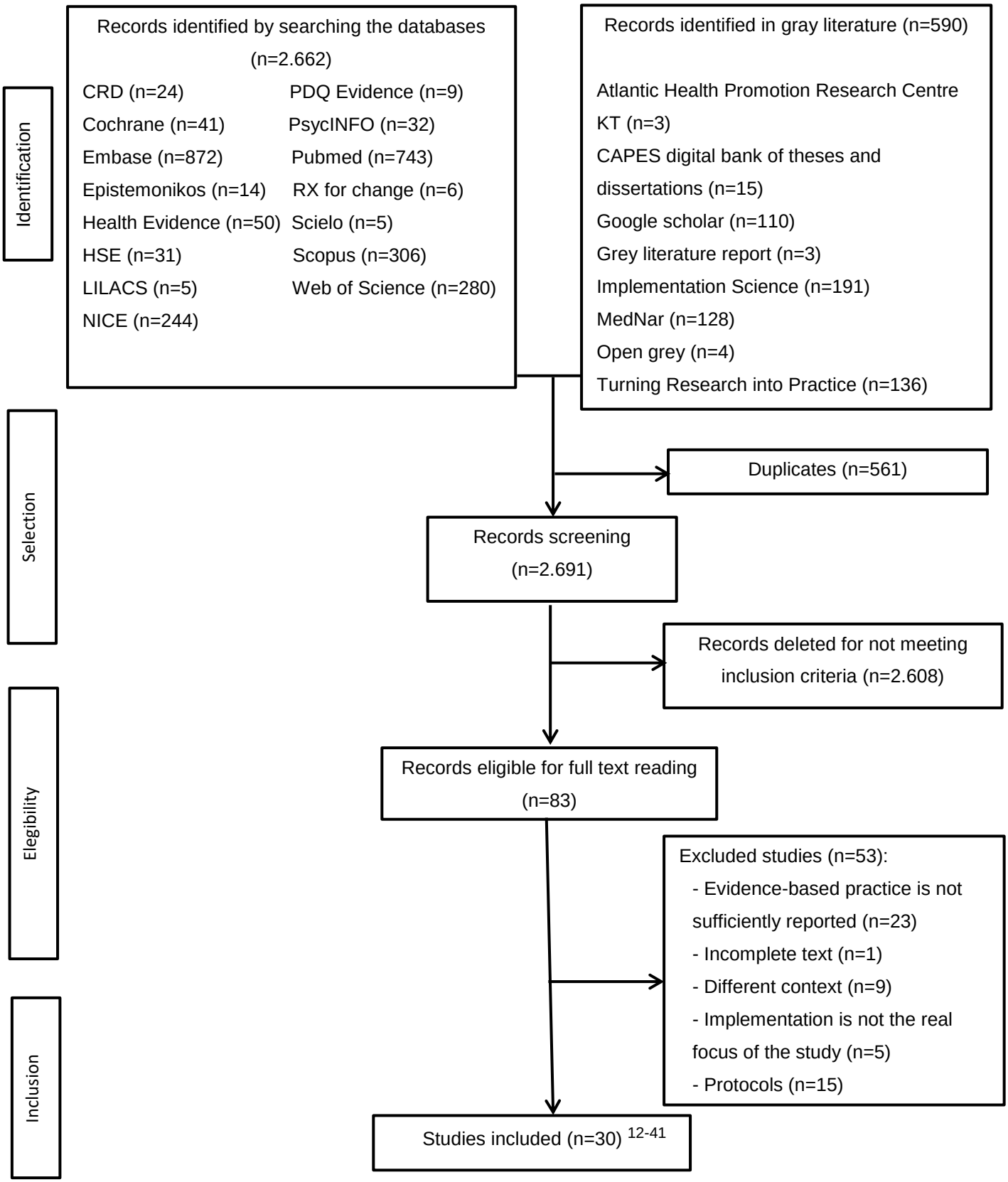

Figure 1. Flowchart of the study selection process.

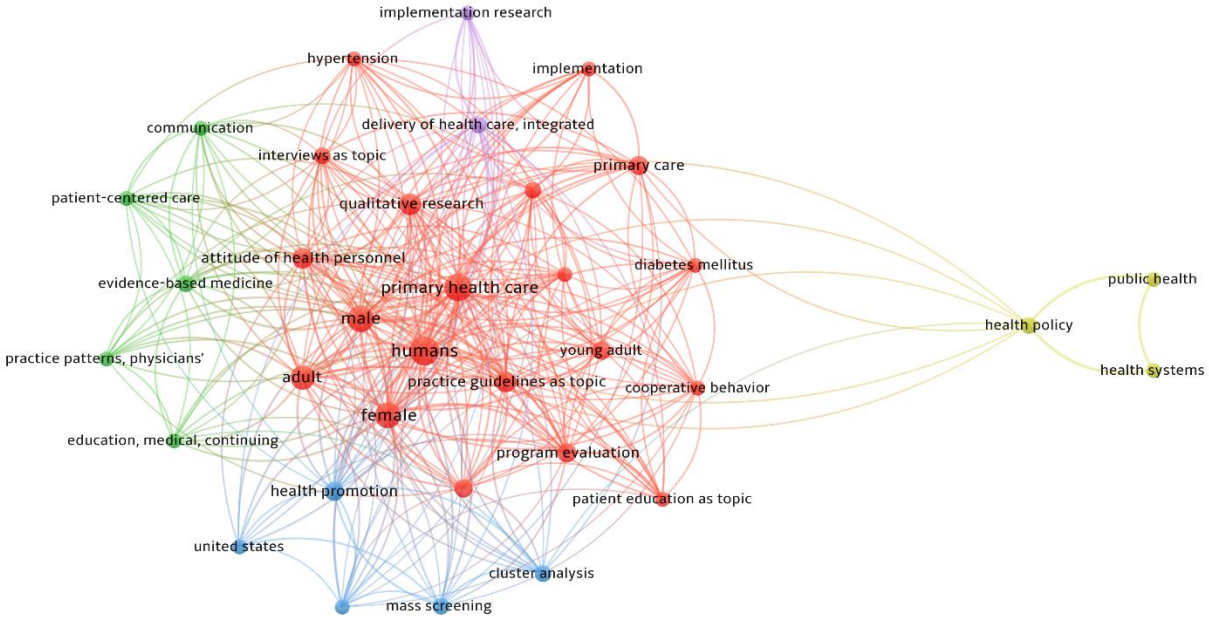

Figure 2. Grouping view of the most frequent keywords in the titles and summaries of implementation studies in the context of primary health care published until October 2019. The main groupings are divided by color. The red cluster represented keywords for the population. The green cluster focused on the main topics studied in primary health care. The purple and blue clusters emphasized the types of study and the yellow to public health. Analysis using VOSviewer software (2019, version 1.6.13, Leiden University).

TABLES

Table 1. Information about authorship of articles included by country.

Country	Articles	Authors	Authors by article
United States	9	109	5,4
Canada	6	45	7,5
United Kingdom	5	36	7,2
Australia	1	15	15,0
Italy	1	11	11,0
Brazil	1	2	2,0
Spain	1	9	9,0
Germany	1	6	6,0
Uganda	1	9	9,0
Mexico	1	12	12,0
Ethiopia	1	21	21,0
South Africa	1	11	11,0
Norway	1	5	5,0
Nigeria	1	17	17,0

Table 2. Main characteristics of the studies included in the review (n = 30).

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Griffiths *et al*., 2007[12] United Kingdom	Evaluate the implementation of a program to promote tuberculosis screening in a primary health care district	cluster randomized study	Physicians and their patients (44,986)	Tuberculosis screening	Tuberculosis screening program	Did not report	TPB	Educational outreach visit + computer reminders for doctors and a financial incentive for each tuberculin skin test performed
Aspy *et al*., 2008[13] United States	Evaluate implementation of screening program and interventions to prevent unhealthy behaviors in primary care practices	interviews, focus group	Nurses (9), Medical Assistants (85)	Prevention of unhealthy behavior (tobacco use, unhealthy diet, physical inactivity and risky alcohol use)	Primary Care Screening and Intervention Program for Preventing Unhealthy Behavior	Yes	RE-AIM	Monthly Audits and Feedback + Unhealthy Behavior Prevention Training + Practice Facilitation + Bimonthly Meetings
Barcelo *et al*., 2010[14] United States	Evaluate the implementation of BTS chronic care model and collaborative diabetes management methodology	cluster randomized study	Medical (317)	Diabetes management	Chronic care model and BTS Collaborative Methodology for Diabetes Management	Not reported	Not reported	Educational meeting
Bekkers *et al.,* 2010[15] United Kingdom	Evaluate the implementation of the STAR Program	interview, focus group	Medical (31)	Antibiotic resistance	STAR Educational Program	Not reported	Not reported	Educational meeting + electronic reminder

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Ciccone *et al*., 2010[16] Italy	To evaluate the implementation of a disease and care management model and the introduction of "care manager" nurses, trained in this specialized role, in the primary health care system	interview, focus group	Family doctors (83)	Cardiovascular disease management, diabetes, heart failure and cardiovascular disease risk	Collaborative Service Model	Not reported	Not reported	Printed educational material
Glisson *et al*., 2010[17] United States	Evaluate implementation of the Multisystem Therapy Program for evidence-based mental health treatments for young offenders	cluster randomized study	Young offenders (615)	Young people in delinquency situations	Multisystemic Therapy Program	Sim	TDF	Educational meeting
Presseau *et al.,* 2011[18] United Kingdom	Predict primary care providers to provide physical activity advice	prospective cohort	Healthcare professionals from all primary care practices (606)	Managing Type 2 Diabetes Patients	Type 2 Diabetes Patient Management Program	Not reported	TPB	Facilitation of practice
Reuters *et al.,* 2012[19] Australia	Evaluate the translation of knowledge into practice for PHC general practitioners on the treatment of type 2 diabetes	cluster randomized study	Clinicians (99)	Ways of administering a medicine, treatment or medical intervention with type 2 diabetes	Structured General Practitioner Education Program	Not reported	Not reported	Mode: personally, print material Duration: 12 months Frequency: 2 workshops

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Goetz *et al.,* 2013[20] United States	Assess the effectiveness of a multicomponent intervention to increase the rate of routine HIV diagnostic testing	before / after	Family doctors (86)	HIV diagnosis	Routine Diagnostic Testing Program for HIV	Not reported	Not reported	Real-time electronic clinical reminder to facilitate HIV testing, feedback reporting, and provider education
Robins *et al.,* 2013[21] United States	Investigate potential facilitators and barriers to implementing a hypertension management strategy in a community setting	interviews	Doctors (15), Staff (18), Pharmacists (5), and Patients (15)	Hypertension Management	The Electronic Communications and Home Blood Pressure Monitoring trial	Sim	CFIR	Audit and Feedback
Steyn *et al.,* 2013[22] South Africa	Evaluate the implementation of national recommendations incorporated into a structured clinical registry of diabetes and hypertension	cluster randomized study	Community Health Centers in Cape Town (18)	Improve knowledge and care in diabetes and hypertension	Self-management diabetes and hypertension program	Not reported	Not reported	Printed educational material
Giguere *et al.,* 2014[23] Canada	Understand barriers and facilitators for using decision box information in clinical practice	surveys, focus groups	Family doctors (100)	Medical Management	Eight evidence-based summary summaries (decision boxes) on common primary care interventions	Not reported	TPB	Printed and web-based educational material

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Kastner *et al*., 2014[24] Canada	Evaluate the implementation of the Op-KT tool	time series interrupted	Family Physicians (5) with 2840 patients	Screening and proper treatment of osteoporosis	Op-KT tool	Not reported	Not reported	Audit and Feedbackc
Loyola-Sanchez *et al.,* 2014[25] Mexico	(a) identify implementation barriers to national recommendations; b) Identify differences in implementation between institutions and regions; and c) Suggest strategies to address barriers and improve implementation	focus groups	Family Physicians (6) and Physiatrist (1)	Management of hip and knee osteoarthritis in the context of primary health care	Recommendations of the 2008 Mexican Clinical Practice Guideline for the treatment of hip and knee osteoarthritis	Not reported	Not reported	Meetings by email, teleconferencing, or in-person
Ong *et al.,* 2014[26] United Kingdom	Identify barriers and drivers for the implementation of national osteoarthritis guidelines	interview, focus group	Doctors (10), Nurses (5)	Osteoarthritis self-management	MOSAICS	Not reported	NPT	Educational meeting
Vest *et al.,* 2015[27] United States	Evaluate the implementation of evidence-based guidelines for chronic kidney disease (CKD) in primary care practice	telephone interviews	Primary Practitioners (27)	Self-management of kidney disease	CKD Self-Management Program	Yes	NPT	Facilitation of practice
Aakus *et al.,* 2016[28] Norway	Evaluate the effectiveness of personalized interventions to improve care for chronic disease patients	cluster randomized study	Primary Care Providers (51)	Depression Counseling or Care Service	Adult Depression Management Program	Yes	Not reported	Outreach visit, distribution of printed educational material associated with community intervention

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Mares *et al.,* 2016[29] United States	Identify barriers and facilitators for implementing mHealth for PHC follow-up of people with substance use disorders	interviews, focus groups	Doctors (53)	Managing Substance Use Disorders	Seva, a communication technology integrated with eHealth electronic registration	Yes	Not reported	Educational meeting
Sopcak *et al.,* 2016[30] Canada	Understand the facilitators and barriers of implementing the BETTER program among physicians, patients and stakeholders in three PHC contexts (urban, rural and remote)	interviews, focus groups	Community centers urban (9), rural (6) and remote (5)	Prevention and tracking of cardiovascular disease, diabetes, cancer and lifestyle factors	BETTER Toolkit	Yes	CFIR	Prevention Professional, a healthcare professional with specialized chronic disease prevention skills who meets with patients to develop a personalized prevention prescription
Martinez *et al*., 2017[31] Spain	Describe factors that determine changes in the performance of primary health care centers involved in piloting PVS innovation	interview	Primary health care centers (4)	Health promotion	PVS	Yes	CFIR	Top-down support from managers, bottom-up organizational change in PHC and development of innovative eHealth information and communication Technologies

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Awotiwon *et al.*, 2018[32] Nigeria	Adapt and implement a South African primary care strategy	interview, focus group	Clinicians (354)	NCDs Management	Program (PACK)	Yes	Not reported	1) introductory workshop, 2) conference calls and 3) PACK training
Luig *et al.,* 2018[33] Canada	Describe determinants for implementing 5Aseam Toolkit	interviews	Patients (20), Doctors (31)	Improve knowledge and control of obesity	5AsTeam Toolkit	Yes	Interactive system structure	Speaker sessions at biweekly collaborative learning meetings, practice facilitation
Mekonnen *et al*., 2018[34] Ethiopia	Adapt and implement a South African primary care strategy	interviews	Health Professionals (94)	NCDs Management	PACK Program, Approach Kit to Promote Comprehensive, Comprehensive, Informed Primary Care as a Means of Achieving Universal Health Coverage	Yes	Not reported	1) a clinical decision support tool (the PACK Global Adult guide) 2) a training strategy 3) a health system strengthening component 4) monitoring and evaluation elements
Quanbeck *et al*., 2018[35] United States	Report the effects of implementing mHealth for PHC follow-up of people with substance use disorders	Efficacy Implementation Hybrid Type 2	Patients (100), Doctors (85)	Managing Substance Use Disorders	Seva, a communication technology integrated with eHealth electronic registration	Yes	RE-AIM	1) training 2) Seva application 3) perform quick cycle tests

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Stephan *et al.,* 2018[36] Germany	Understand what barriers primary care providers see when diagnosing and treating vertigo patients	interviews	Primary Care Providers (12)	Dizziness Management	National recommendations for managing vertigo patients	Not reported	TDF, CFIR	Educational meeting
Wattrus *et al.,* 2018[37] Brazil	Adapt and implement a South African primary care strategy	interview, focus group	Health Professionals (160)	NCDs Management	PACK program, approach kit to promote integrated, comprehensive and evidence-informed primary care as a means to achieve universal health coverage.	Yes	Not reported	1) a clinical decision support tool (the PACK Global Adult guide) 2) a training strategy 3) a health system strengthening component 4) monitoring and evaluation elements
Kumar *et al.,* 2019[38] United States	Assess the implementation of an integrated intervention in noncommunicable disease management	prospective cohort	597 individuals with 4,657 visits over 18 months	Management of type II diabetes, hypertension and chronic obstructive pulmonary disease	Integrated intervention for management of type II diabetes, hypertension and chronic obstructive pulmonary disease	Not reported	Not reported	1) Strengthening the workforce 2) digital tools and online electronic health records shared using clinical decision support algorithms

First author, year of publication / Country Research	Objective Research	Research Design	Target Population / Sample Size	Implementation condition	Evidence-based practice	Stakeholder engagement	Theoretical justification	Strategy for implementation
Musinguzi *et al.*, 2019[39] Uganda	Implement an improved CVD prevention program, evaluate the implementation process and determine effectiveness in improving profiles for people with intermediate and high CVD risk factors.	Interviews	Health Professionals (1,000)	CVD Prevention	Enhanced CVD Prevention Program	Not reported	RE-AIM, CFIR	Educational meeting with community health workers + electronic and print media
Pannebakker *et al.,* 2019[40] United Kingdom	Understand eCDS implementation and utility	telephone interviews	Primary Practitioners (87)	Melanoma Diagnosis	7 Point Diagnostic Checklist for Melanoma	Not reported	CFIR	ECDS Clinical Decision Support Tool
Wagner *et al*., 2019[41] Canada	Identify barriers or facilitators to implementing primary care team audit and feedback	semi-structured interviews	Key informants of primary care practices (25)	General	National recommendations for managing vertigo patients to measure and improve the quality of primary team care	Yes	CFIR	Audit and Feedback

TPB: Theory of Planned Behavior, BTS: Breakthrough Series, CFIR: Consolidated Framework for Implementation Research, RE-AIM: Reach, Efficacy/ Effectiveness, Adoption, Implementation, Maintenance, STAR: Stemming the Tide of Antibiotic Resistence, TDF: Theoretical Domains Framework, Op-KT: translation of knowledge for osteoporosis: NPT: Normalization Process Theory, mHealth: mobile health, eHealth: eletronic health, BETTER: Building on Existing Tools to Improve Chronic Disease Prevention and Screening in Primary Care, PVS: Prescribe Vida Saludable, NCDs : noncommunicable chronic diseases, PACK: Practical Approach to Care Kit, CVD: cardiovascular disease, eCDS: eletronic clinical decision support

Table 3. Description of models and theoretical frameworks of implementation studies

Models	Description	Source Field	References	Studies that used the model
*Consolidated Framework for Implementation Research (*CFIR)	Theoretical framework of implementation science that synthesizes the concepts of various models available in 39 items organized into five interrelated domains: (a) intervention characteristics (source of intervention, strength and quality of evidence, relative advantage, adaptability, evaluability, complexity) , project quality and cost) (b) external configuration (patient needs and resources, cosmopolitanism (the degree to which one organization is networked with others), peer pressure to implement the intervention and external policies and incentives) (c) internal configuration (structural characteristics, networks and communications, and readiness for implementation (d) characteristics of the individuals involved (knowledge and beliefs about the intervention, self-efficacy to implement the intervention, individual stage of change, individual identification with the organization and other personal attributes) (e) implementation process (planning, engagement, execution, reflection and evaluation)	Health services	42	21,30,31,36,39-41
Interactive system structure	Conceptualize interactions between organization, team capacity and intervention implementation, such as: a) moving knowledge to individual and team capacity building; b) training to practice integration; c) interactions of implementation processes with context; and d) bidirectional movement between research and practice.	Violence prevention	47	33
Theoretical Domains Framework (TDF)	It is one of the two most frequently used theories for the subject of guideline implementation. It is a summary of the constructs of behavioral change theories, which offer the possibility of being further combined and extended with other frameworks.	Health care	46	17,36

Models	Description	Source Field	References	Studies that used the model
Framework Reach, Efficacy/ Effectiveness, Adoption, Implementation, Maintenance (RE-AIM)	Specify aspects of implementation that can be evaluated to determine the success of translating research into practice in five steps: a) Reach (what proportion of the target population was reached?) b) Effectiveness or effectiveness (what is the impact of the intervention on the specified outcome criteria?) c) Adoption (what proportion of clinicians / organizations that adopted the intervention?) d) Implementation consistency (what is the quality / consistency of delivery in real environments?) e) Maintenance (to what extent is the intervention sustained over time?)	Public health	43	13,35,39
Normalization Process Theory (NPT)	It provides a theoretical framework for understanding the work (capable of being put into action) and the integration (assimilation into practice) of an intervention and demonstrates how it can be used to understand the results.	Helath care	45	26,27
Theory of Pplanned Behavior (TPB)	It states that behavioral intentions are guided by behavioral attitudes, subjective peer norms, and perceived behavior control and implementation interventions have been selected to address each of these constructs.	Public health	44	12,18,23

APPENDICES

Appendix 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR)

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	34
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	34
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	35
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	35
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	35
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	35
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	36
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	36
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	37
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	37
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	37

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	37
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	38
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	38
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	39
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	39
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	39
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	40
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	41
Limitations	20	Discuss the limitations of the scoping review process.	45
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	46
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	47

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

Fonte: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews

Appendix 2. *Checklist Peer Review of Electronic Search Strategie (*PRESS)

SEARCH SUBMISSION: THIS SECTION TO BE FILLED IN BY THE SEARCHER

Searcher: Keitty RC Andrade Email: keittyregina@hotmail.com Date submitted: 14/2/2019 Date requested by: *[Maximum = 5 working*

Systematic Review Title:

Characteristics of implementation studies in the context of primary health care: a scope review

This search strategy is …

X	My PRIMARY (core) database strategy — First time submitting a strategy for search question and database
	My PRIMARY (core) strategy — Follow-up review NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions
	SECONDARY search strategy— First time submitting a strategy for search question and database
	SECONDARY search strategy — NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions

Database

(i.e., MEDLINE,CINAHL…): *[mandatory]*

Medline

Interface

(i.e., Ovid, EBSCO…): *[mandatory]*

Pubmed

Research question

(Describe the purpose of the search) *[mandatory]*

What are the configurations regarding bibliometrics and methodological approaches of implementation studies in the context of primary health care?

Structured research question (Population, Concept e Context)

P	Service providers, policy makers and managers
C	Implementation of evidence in practice
C	Primary health care

Inclusion Criteria

(List criteria such as age groups, study designs, etc., to be included) *[optional]*

Studies that have addressed methods for implementing any evidence-based practice in the context of primary health care, outpatient clinics, family medicine departments and / or community settings à saúde

Exclusion Criteria

(List criteria such as study designs, date limits, etc., to be excluded) *[optional]*

Studies that did not clearly report evidence-based practice used for implementation, studies addressing the health system in general without extratifying findings for primary health care, and studies that used research implementation methods without results from the processes performed.

Was a search filter applied?

Yes ☐ No ☒

If YES, which one(s) (e.g., Cochrane RCT filter, PubMed Clinical Queries filter)? Provide the source if this is a published filter. *[mandatory if YES to previous question — textbox]*

Other notes or comments you feel would be useful for the peer reviewer? ***[optional]***

Please copy and paste your search strategy here, exactly as run, including the number of hits per line. ***[mandatory]***

(("knowledge translation"[TIAB] OR “knowledge transfer” [TIAB] OR “knowledge mobilization”[TIAB] OR “implementation research”[TIAB] OR “implementation science”[TIAB] OR “implementation methods”[TIAB] OR “research implementation”[TIAB] OR "research utilization”[TIAB] OR "translating evidence”[TIAB] OR " research use”[TIAB] OR “kstar”[TIAB]) AND (“Primary Health Care” [Mesh] OR "primary care”[TIAB] OR “first-line health services”[TIAB] OR “primary healthcare”[TIAB]))

PEER REVIEW ASSESSMENT: THIS SECTION TO BE FILLED IN BY THE REVIEWER

Reviewer: Aurélio M Andrade	Email: aury87@hotmail.com	Date completed: 19/02/2019

1. TRANSLATION

A --- No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

2. BOOLEAN AND PROXIMITY OPERATORS

A --- No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

3. SUBJECT HEADINGS

A -- -No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

4. TEXT WORD SEARCHING

A ---No revisions	x
B --- Revision(s)suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

5. SPELLING, SYNTAX, AND LINE NUMBERS

A ---No revisions	x
B --- Revision(s)suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

6. LIMITS AND FILTERS

A ---No revisions	x

B --- Revision(s) suggested	
C --- Revision(s) required	

If “B” or “C,” please provide an explanation or example:

OVERALL EVALUATION (Note: If one or more “revision required” is noted above, the response below must be “revisions required”.)

A ---No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

Appendix 3. Search strategy for each database and gray literature.

Data base	Strategies
CRD	((knowledge translation OR evidence-based practice OR translational research OR knowledge transfer OR knowledge exchange)) AND (population health or public health OR healthcare OR health-related)
Cochrane Library	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”)
Embase	('knowledge translation' OR 'evidence-based practice'/exp OR 'evidence based medicine'/exp) AND 'primary health care'/exp AND [embase]/lim NOT [medline]/lim
Epistemonikos	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND ("primary health care" OR "first line" OR "primary care")
Health Evidence	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND ("primary health care" OR "first line" OR "primary care")
HSE	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND "primary health care" OR "first line" OR "primary care"
LILACS	(tw:((use of evidence) OR (evidence informed) OR (know-do gap) OR (uso de evidência) OR (informada por evidência) OR (knowledge translation))) AND (tw:((primary health care) OR (atenção primária à saúde)))
NICE	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine") AND "primary health care"
PDQ Evidence	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR “first line” OR “primary care”)
PsycINFO	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR “first line” OR “primary care”)
PubMed	(("knowledge translation"[TIAB] OR “knowledge transfer” [TIAB] OR “knowledge mobilization”[TIAB] OR “implementation research”[TIAB] OR “implementation science”[TIAB] OR “implementation methods”[TIAB] OR “research implementation”[TIAB] OR "research utilization”[TIAB] OR "translating evidence”[TIAB] OR " research use”[TIAB] OR “kstar”[TIAB]) AND (“Primary Health Care” [Mesh] OR "primary care”[TIAB] OR “first-line health services”[TIAB] OR “primary healthcare”[TIAB]))
RX for change	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine") AND "primary health care"
Scielo	(("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”))
Scopus	((knowledge translation OR knowledge transfer OR translation evidence OR evidence-based practice) AND (primary health care OR primary care))
Web of Science	(("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”))
Gray Literature	
Analysis & Policy Observatory	Knowledge translation
Bank of theses and	"tradução do conhecimento"

dissertations of CAPES	
Google scholar	allintitle: ("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care")
Grey literature report	"knowledge translation"
Implementation Science	"knowledge translation"
MEdNar	"knowledge translation" ("primary care" OR "first line")
Open grey	"knowledge translation"
Turning Research into Practice	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”)

CRD: Centre for Reviews and Dissemination; EMBASE: Excerpta Medical dataBASE; HSE: Health Systems Evidence; LILACS: Literatura Latino-americana e do Caribe em Ciências da Saúde; NICE: Nacional Institute for Health and Care Excellence Evidence Search

Appendix 4. Email sent regarding data extraction validation.

Dear Dr. “name of corresponding and/or first author”,

Hoping this email finds you well.

I am a doctoral researcher in Knowledge Translation under the supervision of Dr Mauricio Gomes Pereira. We are currently conducting a scoping review entitled "Characteristics of implementation of studies in the context of primary health care".

Your article titled “Title of publication” has been identified for inclusion in our review. We would be most grateful if you could validate the extraction we have performed of your study, correcting any inaccuracies and providing any missing information (see attached document). This should not take you more than a few minutes of your time and will ensure appropriate representation of your work.

We would appreciate if you could let us know by July 31th 2019. Please don’t hesitate to contact us for further details.

Thank you very much for your help,

Keitty Regina Cordeiro de Andrade

Appendix 5. Excluded articles and their reasons.

Evidence-based practice is not sufficiently reported
Trivedi MH, Jha MK, Kahalnik F, Pipes R, Levinson S, Lawson T, Rush AJ, Trombello JM, Grannemann B, Tovian C, Kinney R, Clark EW, Greer TL. VitalSign6: A Primary Care First (PCP-First) Model for Universal Screening and Measurement-Based Care for Depression. Pharmaceuticals (Basel). 2019 May 14;12(2). Pii: E71. doi: 10.3390/ph12020071.
Walling AM, Sudore RL, Bell D, Tseng CH, Ritchie C, Hays RD, Gibbs L, Rahimi M, Sanz J, Wenger NS. Population-Based Pragmatic Trial of Advance Care Planning in Primary Care in the University of California Health System. J Palliat Med. 2019 Sep; 22(S1):72-81. Doi: 10.1089/jpm.2019.0142.
Petersen I, van Rensburg A, Kigozi F, Semrau M, Hanlon C, Abdulmalik J, Kola L, Fekadu A, Gureje O, Gurung D, Jordans M, Mntambo N, Mugisha J, Muke S, Petrus R, Shidhaye R, Ssebunnya J, Tekola B, Upadhaya N, Patel V, Lund C, Thornicroft G. Scaling up integrated primary mental health in six low- and middle-income countries: obstacles, synergies and implications for systems reform. BJPsych Open. 2019 Aug 6;5(5): e69. doi: 10.1192/bjo.2019.7.
Van Rinsum C, Gerards S, Rutten G, Johannesma M, van de Goor I, Kremers S. The implementation of the coaching on lifestyle (CooL) intervention: lessons learnt. BMC Health Serv Res. 2019 Sep 14;19(1):667. doi: 10.1186/s12913-019-4457-7.
Pons-Vigués M, Berenguera A, Coma-Auli N, March S, Pombo H, Masluk B, Pulido-Fuentes M, Rodriguez C, Bellón JA, Pujol-Ribera E. Qualitative evaluation of a complex intervention to implement health promotion activities according to healthcare attendees and health professionals: EIRA study (phase II). BMJ Open. 2019 Mar 23; 9(3):e023872. Doi: 10.1136/bmjopen-2018-023872.
Rarere M, Oetzel J, Masters-Awatere B, Scott N, Wihapi R, Manuel C, Gilbert R. Critical reflection for researcher-community partnership effectiveness: the He Pikinga Waiora process evaluation tool guiding the implementation of chronic condition interventions in Indigenous communities. Aust J Prim Health. 2019 Sep 11. doi: 10.1071/PY19022.

Luc M, Corriveau H, Boire G, Filiatrault J, Beaulieu MC, Dagenais P, Gaboury I. Implementing a fracture follow-up liaison service: perspective of key stakeholders. Rheumatol Int. 2019 Sep 9. doi: 10.1007/s00296-019-04413-6.
Holt JM, Cusatis R, Asan O, Williams J, Nukuna S, Flynn KE, Moore J, Crotty BH. Incorporating patient-generated contextual data into care: Clinician perspectives using the Consolidated Framework for Implementation Science. Healthc (Amst). 2019 Aug 21:100369. doi: 10.1016/j.hjdsi.2019.100369
Wray LO, Ritchie MJ, Oslin DW, Beehler GP. Enhancing implementation of measurement-based mental health care in primary care: a mixed-methods randomized effectiveness evaluation of implementation facilitation. BMC Health Serv Res. 2018 Oct 3;18(1):753. doi: 10.1186/s12913-018-3493-z.
Fernald DH, Simpson MJ, Nease DE Jr, Hahn DL, Hoffmann AE, Michaels LC, Fagnan LJ, Daly JM, Levy BT. Implementing Community-Created Self-Management Support Tools in Primary Care Practices: Multimethod Analysis From the INSTTEPP Study. J Patient Cent Res Rev. 2018 Oct 29;5(4):267-275. doi: 10.17294/2330-0698.1634. eCollection 2018 Fall.
Incomplete text
Possemato K, Johnson EM, Wray LO, Webster B1 Stecker T. The implementation and testing of a referral management system to address barriers to treatment seeking among primary care veterans with PTSD. Psychol Serv. 2018 Nov;15(4):457-469. doi: 10.1037/ser0000150. Epub 2017 Jul 17.
Different context
Leonard C, Gilmartin H, McCreight M, Kelley L, Lippmann B, Mayberry A, Coy A, Lawrence E, Burke RE. Operationalizing an Implementation Framework to Disseminate a Care Coordination Program for Rural Veterans. J Gen Intern Med. 2019 May;34(Suppl 1):58-66. doi: 10.1007/s11606-019-04964-1.
Forstner J, Straßner C, Kunz A, Uhlmann L, Freund T, Peters-Klimm F, Wensing M, Kümmel S, El-Kurd N, Rück R, Handlos B, Szecsenyi J. Improving continuity of patient care across sectors: study protocol of a quasi-experimental multi-centre study regarding an admission and discharge model in Germany (VESPEERA). BMC Health Serv Res. 2019 Mar 29;19(1):206. doi: 10.1186/s12913-019-4022-4.

Lewis NV, Dowrick A, Sohal A, Feder G, Griffiths C. Implementation of the Identification and Referral to Improve Safety programme for patients with experience of domestic violence and abuse: A theory-based mixed-method process evaluation. Health Soc Care Community. 2019 Jul;27(4):e298-e312. doi: 10.1111/hsc.12733. Epub 2019 Mar 13.
Worum H, Lillekroken D, Ahlsen B, Roaldsen KS, Bergland A. Bridging the gap between research-based knowledge and clinical practice: a qualitative examination of patients and physiotherapists' views on the Otago exercise Programme. BMC Geriatr. 2019 Oct 21;19(1):278. doi: 10.1186/s12877-019-1309-6.
Spooner AJ, Aitken LM, Chaboyer W. Implementation of an Evidence-Based Practice Nursing Handover Tool in Intensive Care Using the Knowledge-to-Action Framework. Worldviews Evid Based Nurs. 2018 Apr;15(2):88-96. doi: 10.1111/wvn.12276. Epub 2018 Mar 8.
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Forman J, Harrod M, Robinson C, Annis-Emeott A, Ott J, Saffar D, Krein SL, Greenstone CL. First things first: foundational requirements for a medical home in an academic medical center. J Gen Intern Med. 2014 Jul;29 Suppl 2: S640-8. doi: 10.1007/s11606-013-2674-z.
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Bradley KA, Williams EC, Achtmeyer CE, Volpp B, Collins BJ, Kivlahan DR. Implementation of evidence-based alcohol screening in the Veterans Health Administration. Am J Manag Care. 2006 Oct;12(10):597-606.
Implementation is not the real focus of the study
Saif-Ur-Rahman KM, Mamun R, Nowrin I, Hossain S, Islam K, Rumman T, Kabir E, Rahman A, Dahal N, Anwar I. Primary healthcare policy and governance in low-income and middle-income countries: an evidence gap map. BMJ Glob Health.

2019 Aug 16;4(Suppl 8): e001453. doi: 10.1136/bmjgh-2019-001453. eCollection 2019.
Low LL, Ab Rahim FI, Johari MZ, Abdullah Z, Abdul Aziz SH, Suhaimi NA, Jaafar N, Mohd Hanafiah AN, Kong YL, Mahmud SH, Zulkepli MZ, Perialathan K, Muharam N, Zainudin NH, Mohd Zin Z, Mohd Roslan N, Aris T, Murad S. Assessing receptiveness to change among primary healthcare providers by adopting the consolidated framework for implementation research (CFIR). BMC Health Serv Res. 2019 Jul 16;19(1):497. doi: 10.1186/s12913-019-4312-x.
Krustev E, Dubrowski A. Development and Implementation of a Three-dimensional Printed Knee Joint Simulation Model Using the Consolidated Framework for Implementation Research: Addressing Local Simulation Needs. Cureus. 2019 Apr 2;11(4):e4364. doi: 10.7759/cureus.4364.
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Owen RR, Woodward EN, Drummond KL, Deen TL, Oliver KA, Petersen NJ, Meit SS, Fortney JC, Kirchner JE. Using implementation facilitation to implement primary care mental health integration via clinical video telehealth in rural clinics: protocol for a hybrid type 2 cluster randomized stepped-wedge design. Implement Sci. 2019 Mar 21;14(1):33. doi: 10.1186/s13012-019-0875-5.
Kongsted A, Ris I, Kjaer P, Vach W, Morsø L, Hartvigsen J. GLA:D® Back: implementation of group-based patient education integrated with exercises to support self-management of back pain - protocol for a hybrid effectiveness-implementation study. BMC Musculoskelet Disord. 2019 Feb 18;20(1):85. doi: 10.1186/s12891-019-2443-1.

Harasemiw O, Drummond N, Singer A, Bello A, Komenda P, Rigatto C, Lerner J, Sparkes D, Ferguson TW, Tangri N. Integrating Risk-Based Care for Patients With Chronic Kidney Disease in the Community: Study Protocol for a Cluster Randomized Trial. Can J Kidney Health Dis. 2019 May 29; 6:2054358119841611. doi: 10.1177/2054358119841611. eCollection 2019.
Ekawati FM, Licqurish S, Emilia O, Gunn J, Brennecke S, Lau P. Developing management pathways for hypertensive disorders of pregnancy (HDP) in Indonesian primary care: a study protocol. Reprod Health. 2019 Feb 1;16(1):12. doi: 10.1186/s12978-019-0674-0.
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Midboe AM, Martino S, Krein SL, Frank JW, Painter JT, Chandler M, Schroeder A, Fenton BT, Troszak L, Erhardt T, Kerns RD, Becker WC. Testing implementation facilitation of a primary care-based collaborative care clinical program using a hybrid type III interrupted time series design: a study protocol. Implement Sci. 2018 Nov 29;13(1):145. doi: 10.1186/s13012-018-0838-2.
Zabaleta-Del-Olmo E, Pombo H, Pons-Vigués M, Casajuana-Closas M, Pujol-Ribera E, López-Jiménez T, Cabezas-Peña C, Martín-Borràs C, Serrano-Blanco A, Rubio-Valera M, Llobera J, Leiva A, Vicens C, Vidal C, Campiñez M, Martín-Álvarez R, Maderuelo JÁ, Recio JI, García-Ortiz L, Motrico E, Bellón JÁ, Moreno-Peral P, Martín-Cantera C, Clavería A, Aldecoa-Landesa S, Magallón-Botaya R, Bolíbar B. Complex multiple risk intervention to promote healthy behaviours in people between 45 to 75 years attended in primary health care (EIRA study): study protocol for a hybrid trial. BMC Public Health. 2018 Jul 13;18(1):874. doi:

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Young AS, Cohen AN, Chang ET, Flynn AWP, Hamilton AB, Oberman R, Vinzon M. A clustered controlled trial of the implementation and effectiveness of a medical home to improve health care of people with serious mental illness: study protocol. BMC Health Serv Res. 2018 Jun 7;18(1):428. doi: 10.1186/s12913-018-3237-0.

DeBar L, Benes L, Bonifay A, Deyo RA, Elder CR, Keefe FJ, Leo MC, McMullen C, Mayhew M, Owen-Smith A, Smith DH, Trinacty CM, Vollmer WM. Interdisciplinary team-based care for patients with chronic pain on long-term opioid treatment in primary care (PPACT) - Protocol for a pragmatic cluster randomized trial. Contemp Clin Trials. 2018 Apr; 67:91-99. doi: 10.1016/j.cct.2018.02.015. Epub 2018 Mar 6.

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Naidoo K, Gengiah S, Yende-Zuma N, Padayatchi N, Barker P, Nunn A, Subrayen P, Abdool Karim SS. Addressing challenges in scaling up TB and HIV treatment integration in rural primary healthcare clinics in South Africa (SUTHI): a cluster randomized controlled trial protocol. Implement Sci. 2017 Nov 13;12(1):129. doi: 10.1186/s13012-017-0661-1

Hamilton AB, Farmer MM, Moin T, Finley EP, Lang AJ, Oishi SM, Huynh AK, Zuchowski J, Haskell SG, Bean-Mayberry B. Enhancing Mental and Physical Health of Women through Engagement and Retention (EMPOWER): a protocol for

a program of research. Implement Sci. 2017 Nov 7;12(1):127. doi: 10.1186/s13012-017-0658-9.

Wolk CB, Jager-Hyman S, Marcus SC, Ahmedani BK, Zeber JE, Fein JA, Brown GK, Lieberman A, Beidas RS. Developing implementation strategies for firearm safety promotion in paediatric primary care for suicide prevention in two large US health systems: a study protocol for a mixed-methods implementation study. BMJ Open. 2017 Jun 24;7(6):e014407. doi: 10.1136/bmjopen-2016-014407.

CAPÍTULO 3 - EFFECTIVENESS OF KNOWLEDGE TRANSLATION STRATEGIES FOR USE IN PRIMARY HEALTH CARE: AN OVERVIEW OF SYSTEMATIC REVIEWS

ABSTRACT

Background: The difference between research findings and clinical practice is well documented and a few uses have been developed to increase the implementation of research in health policies and practices.

Objective: To provide an overview of the available evidence on the effectiveness of knowledge translation strategies directed at primary health care professionals.

Methods: An overview of systematic reviews of the effectiveness of interventions aimed at increasing the use of research in primary care practice. A search for relevant systematic reviews was performed at the Center for Reviews and Dissemination, Cochrane Database of Systematic Reviews, Embase, Epistemonikos, Health Evidence, Health Systems Evidence, Latin American and Caribbean Health Sciences Literature, National Institute for Health and Care Excellence Evidence Search, PDQ Evidence, PyscINFO, PubMed, RX for Change, Scielo, Scopus, Web of Science and Gray Literature in october 2018 and updated in may 2019. The selection, data extraction, methodological quality assessment and reliability of the evidence was independently performed by two reviewers.

Results: Thirteen systematic reviews included 176 primary studies were included. Some strategies were identified: printed educational material, audits and feedback, opinion leaders, use of clinical evidence, online platform, knowledge broker, educational meeting, reminder, facilitation of practice and multifaceted intervention. This overview includes the unique little display effects such as audits and feedback, reminders, and opinion leaders. Only interventions claim an improvement in application over multifaceted interventions, with varying effect sizes.

Conclusion: This overview is a synthesis of the knowledge translation strategies available to primary health care professionals.

Studies have shown few beneficial effects in strategies as such as audits and feedback, educational visit, reminders and opinion leaders. Multifaceted

interventions were no longer able than unique interventions but are often used to promote or use research in practice. These results may inform decision makers, as well as list available strategies already studied.
Keywords: knowledge translation; translational medical research; evidence-based; primary health care

3.1 INTRODUCTION

Despite considerable investment in health research, there are still difficulties in translating the results of scientific evidence into policy and practice[1]. Knowledge translation has emerged as a promising way to overcome this difficulty and thus improve the quality of health service delivery [2-3].

Primary health care is the initial contact of the patient in health systems and offers a wide range of services to meet individuals with multiple and sometimes complex health conditions. Despite its importance, primary care provision consists of exponentially growing evidence, often not guaranteed by health professionals and managers, what contributed to failed processes, especially health promotion and prevention [4].

The comparison between different knowledge translation strategies has been investigated, especially in the last decade, with systematic reviews giving mixed results [5-10]. This contradictory evidence may increase uncertainty about the choice of strategy for transferring scientific knowledge to practice.

To deal the substantial increase in the number of overlapping systematic reviews, guidance has been provided on how to perform systematic reviews overviews [11,12]. The purpose of overviews is to summarize evidence, synthesizing results from multiple systematic reviews into a single, useful document [13]. Thus, the purpose of this overview is to investigate strategies for knowledge translation directed to primary health care professionals.

3.2 METHODS

This is an overview of systematic reviews, guided by the Handbook Cochrane [12]. The protocol was registered on the platform International Prospective Register of Systematic Reviews, under the number CRD42019135337 (Appendix 1). The study was described according to the recommendations of Preferred Reporting Items for Systematic Review and Meta-Analysis [14] (Appendix 2).

3.2.1 Eligibility criteria

Systematic reviews were included when evaluating the effectiveness of knowledge translation strategies for primary care health professionals. We considered a systematic review, literature reviews describing the search strategy, eligibility criteria and quality evaluation of the included studies[14]. Knowledge translation has been defined as a dynamic and interactive process that includes the synthesis, dissemination, exchange and ethical application of knowledge to provide more effective health products and services [15,16].

For the purposes of this overview we focus on dissemination and implementation strategies. The first refers to the active approach of disseminating research results to the target audience, and the second is the process of using or integrating evidence-based interventions into practice, policy or programs. [17-19].

If multiple publications by the same author or group were identified, the publications were read again to decide if the reported reviews or essays were the same. In these cases, the most recent publication has been selected unless the previous publication with more information. We have restricted our research to systematic reviews and studies published over the past ten years. There was no restriction on the language and status of the publication. We include Cochrane and non-Cochrane reviews.

Reviews that did not explicitly report the strategy used to mobilize research evidence into practice, studies that investigated only barriers and facilitators of evidence use, and studies that could not extract separate data for primary health care were excluded.

3.2.2 Search strategy and information sources

The literature search for eligible studies was performed on october 20, 2018 and last updated on may 2019 in the following electronic databases: Center for Reviews and Dissemination, Cochrane Database of Systematic Reviews, Embase, Epistemonikos, Health Evidence, Health Systems Evidence, Latin American and Caribbean Health Sciences Literature, National Institute for Health

and Care Excellence Evidence Search, PDQ Evidence, PyscINFO, PubMed, RX for Change, Scielo, Scopus and Web of Science.

The search strategy was designed by one researcher (KRCA) and validated by another researcher (AMA) through the Peer Review of Electronic Search Strategies checklist (Appendix 3). This tool evaluates items such as research question translation, the use of boolean operators, search-related topics, term spelling, and filters to expand or narrow the search [20].

A search strategy was developed using the terms MeSH, EMTREE, and a combination of keywords. For example, a complete search strategy used in Pubmed was: ("knowledge translation"[TIAB] OR "knowledge management"[TIAB] OR "knowledge-translation"[TIAB] OR “knowledge transfer” [TIAB] OR "know-do gap"[TIAB] OR “knowledge brokering”[TIAB] OR “knowledge exchange”[TIAB] OR “knowledge mobilization”[TIAB] OR dissemination OR implementation OR “implementation research”[TIAB] OR “implementation science”[TIAB] OR “implementation methods”[TIAB] OR “research implementation”[TIAB] OR “implementation gap”[TIAB] OR "translational research”[TIAB] OR "translation evidence”[TIAB] OR "translating evidence”[TIAB] OR "translating research”[TIAB] OR "translational medical research”[Mesh] OR “Evidence-informed decision-making”[TIAB] OR “evidence transfer”[TIAB] OR "use of evidence”[TIAB] OR "evidence-informed”[TIAB] OR "evidence informed”[TIAB] OR "research evidence”[TIAB] OR "scientific evidence”[TIAB]) AND (“Physicians, Family”[Mesh] OR “Family Practice”[Mesh] OR “General Practitioners”[Mesh] OR “General Practice”[Mesh] OR “Primary Health Care”[Mesh] OR "primary health care"[TIAB] OR "primary care”[TIAB] OR “first-line health services”[TIAB] OR “primary healthcare”[TIAB]). This strategy has been slightly modified for other databases (Appendix 4).

The literature search was complemented by a manually search of summary in scientific journals such as Implementation Science, BMC Health Services Research, and BMC Systematic Reviews, beside
websites of conference and meeting about knowledge translation. Additionally, citation tracking and reference checking are conducted for all included studies in order to find eligible studies. In cases of incomplete data, the authors were contacted for additional information.

3.2.3 Selection of reviews

After removal of duplicates, title and abstract screening were performed. The team calibrated the eligibility criteria with a random sample of titles and abstracts selected by two independent researchers (KRCA, AMA). Two calibration exercises, with 50 records at a time, were required for the team to reach 90% agreement. Disagreements were resolved by consensus among the reviewers. The full text reading followed similar parameters with the calibration of 15 random articles.

3.2.4 Data extraction

Two authors (KRCA, AMA) extracted from the middle of an adapted version of the *Effective Practice and Organisation of Care* (EPOC) [21,22]. Disagreements were resolved by consensus. We validate the extraction of data from eligible studies with their authors by email with a reminder through ResearchGate (Appendix 5). We extracted the following data from the included studies: first author and year of publication, number of studies, type of studies, and country of origin of the studies included in each review, objective of the included review, methods (type of review, research data, databases, participants, outcomes), knowledge translation strategies, main results and certainty of evidence and limitations of the studies.

The knowledge translation strategies of each primary study were applied according to the taxonomy developed by EPOC focusing on health professionals [21,22]. For the classification of outcome indicators, all measures of the care process related to providers were included eg prescription, diagnostic behavior, patient counseling and level of knowledge [23].

3.2.5 Quality assessment

The quality of systematic reviews was assessed by two authors (KRCA, AMA) independently, and disagreements were resolved by consensus. The tool A MeaSurement Tool to Assess Reviews (AMSTAR 2) was used, which classifies the qualities of reviews as: a) high, the review provides an accurate and

comprehensive synthesis of the results; b) moderate, the review has more than one weakness, but has no critical flaws; c) low, the review has a critical flaw and may not provide an accurate and comprehensive summary of available studies addressing the issue of interest; d) critically low, revision has more than one critical flaw [24].

In addition, sample quality for the main outcome was assessed using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) [25]. The lead investigator (KRCA), with validation by the secondary reviewer (AMA), assigned a rating of four quality levels: high, provides a very good indication of the estimated effect; moderate, provides a moderate indication of the estimated effect; low, the estimated effect may be large enough to affect a decision; too low does not provide a reliable indication of the estimated effect [26].

3.2.6 Data synthesis

The heterogeneity of the selected studies and the fact that the results were mostly presented descriptively prevented the combination of individual results in a meta-analysis. Instead, a descriptive synthesis of the results was performed [27]. The focus of the analysis was the effect of knowledge translation interventions on primary outcomes clearly defined by the authors of individual studies.

In the early stages of the review, reference management software (Endnote X9, https://endnote.com) was used to compile search citations and remove duplicates and Covidence software [28] for screening and eligibility of studies. Data extraction, methodological quality assessment and descriptive synthesis were managed by Excel (Microsoft Corporation, EUA).

3.3 RESULTS

3.3.1 Identification of reviews

The search resulted in 4,618 records. After removing duplicates and evaluating titles and abstracts, 51 studies were considered potentially relevant and read in their entirety, of which 13 systematic reviews [30-42] met the eligibility criteria (Figure 1). Of these, nine were Cochrane reviews and the remainder

published in three different journals. The full list of excluded studies and reasons for exclusion are available in Appendix 6.

3.3.2 General features of reviews included

The characteristics of the included systematic reviews are apresented in Table 1. We included 13 systematic reviews [30-42] published between 2011 and 2018. Systematic reviews contained between 2 and 41 primary studies. Of the 176 primary studies in the 13 systematic reviews, there were only five duplications. In systematic reviews, randomized controlled trials (n = 125) were chosen by the authors over the other research designs, followed by interrupted temporary series studies (n = 34), controlled before and after studies (n = 13) and non-randomized studies (n = 4). The duration of the intervention ranged from 1 day to 2 years. The original articles were all published in English.

Most studies were performed in the United States (n = 43), followed by Canada (n = 42), United Kingdom (n = 29) and Australia (n = 19), Netherlands (n = 8), Spain (n = 7), Norway (n = 5), Germany (n = 4), Denmark (n = 3), Sweden (n = 2), Switzerland (n = 2), Italy (n = 2), Belgium (n = 2))), Finland (n = 2), Mexico (n = 2), Ireland (n = 2), Japan (n = 1), Thailand (n = 1) and Scotland (n = 1). Several systematic reviews charge more than one health condition, while others focus on a specific area, including prescription, psychiatric care, chronic noncommunicable diseases, oral health, obesity, and alcohol use.

Regarding the search period in the databases, the study with the oldest period was carried out from 1992 [41] and the study with the most recent search period did so until april 2019[30].

3.3.3 Types of interventions

The interventions consisted of various educational approaches (eg, distribution of educational materials, educational meetings, educational visits) and various additional strategies, including reminders, audit and feedback techniques, knowledge broker, and local opinion leaders, as well as strategies for dissemination of evidence as personalized messages, vignettes. Health decision makers targeted by knowledge translation interventions in the studies were

primarily physicians [30-35,37,38] followed by other health professionals [36,39,40] and policy makers [41,42].

Overall, studies have failed to consistently report details of interventions, such as the theoretical justification for choosing the strategy, as well as the frequency and duration of the process. Most promoted the acquisition of new knowledge or contributed to the implementation of clinical practice guidelines[30,34,37,38]. Some interventions aimed to raise awareness about certain health problems [32,35,36]. Other interventions were aimeded to facilitate behavior change processes and monitor quality of care [31,33,39]. Less often, as strategies aimed at evaluating or synthesizing new knowledge or adapting evidence to the context [40,41,42].

3.3.4 Strategies effectiveness

The ability to make inferences about the strategy of knowledge translation was limited due to the wide range of variations, comparisons and results. Most studies have found a statistically significant effect on the hypothetical direction of at least one indicator. The following is a summary for some of the strategies identified. The results are detailed in detail in table 1.

3.3.4.1 Printed Educational Material (PEM)

The PEM generally refers to the distribution of recommendations, including clinical practice guidelines, audiovisual materials and electronic publications, scientific articles, etc. They are more commonly used, have a lower cost and are generally viable in different configurations [21]. A systematic review [38], with 41 studies, evaluated the effects of PEM on improving professional practice.

Among the studies, seven clinical trials [43-49] and thirty-one interrupted time series studies [50-80] compared the efficacy of printed clinical guidelines with no intervention and three clinical trials compared printed guidelines with same material delivered via CD-ROM [81 -83]. Studies have agreed that when used alone and compared to a control without intervention, PEM can have a beneficial effect on professional practice outcomes.

A meta-analysis[32] of 21 studies[84-104] evaluated the efficacy of PEM compared to workshop or no intervention. This strategy used alone or in combination with other is more active strategy was not effective in improving professional practice.

3.3.4.2 Audit and feedback

Audit and feedback is defined as any summary of clinical performance of health care over a specified period, which may be given in a written, electronic or verbal format, and which may also include recommendations for clinical action [21]. This was examined in two reviews, which dealt with five to twenty-one studies. A review [39] that included 21 studies[105-125] and assessed audit and feedback exclusively showed a significant difference in professional practice compared to no intervention. A meta-analysis [31] with five [125-130] RCTs found that professionals undergoing auditing and feedback are 1.93 more likely to conform to the desired practice when compared to no intervention. He also indicated that intervention can be most effective when: a) the person responsible for the audit and feedback is a supervisor or colleague, b) is provided more than once, c) is offered verbally and in writing, and d) includes clear goals and an action plan.

3.3.4.3 Opinion leader

It concerns the use of locally or nationally recognized people as educationally influential, they establish guidelines for appropriate behavior in clinical practice. [21]. In a systematic review [42], two studies evaluated the strategy in the context of primary health care [131-132] and evidenced that the influence of an opinion leader probably improves the compliance of medical practice. Another review [35] indicated that this strategy can successfully promote evidence-based practice, especially if accompanied by another strategy such as academic detailing; however, the difficulty of identifying opinion leaders and the laborious nature of assessing their impact may limit the use of opinion leaders as a knowledge transfer intervention.

3.3.4.4 Use of evidence syntheses

A systematic review assessed the effectiveness of different interventions designed to support the adoption of evidence from systematic reviews [41]. Interventions in the form of a health report were effective in equalizing medical conduct with evidence [72,73]. The review also showed that offering access to the WHO Reproductive Health Library and conducting interactive training had little effect on the use of research in practice [135]. Another study found that professionals who read a review, which had a summary table, were more likely to improve their practices when compared to those who did not have the summary table [136]. A randomized trial was also included in the review and indicated that tailored messages, combined with access to a systematic review database, had a significant effect on policies adopted in the area of healthy body weight promotion in health departments [137].

3.3.4.5 Online platform

A systematic review investigated the effectiveness of knowledge translation strategies used to promote evidence-based decision-making in the public health context [40]. One of the studies included in the review compared the dissemination of evidence via CD-ROM or the Internet that had significant statistical effects when compared to printed pamphlets [138]. Two other review studies evaluated a knowledge translation platform. It was found that there was no greater use of evidence when professionals accessed only the platform. However, when access to the platform was associated with training and newsletters [139] or personalized messaging and a knowledge broker[137], professionals had improved knowledge.

3.3.4.6 Knowledge broker

Knowledge brokers ensure that relevant evidence is transferred to decision makers [21]. Three systematic reviews assessed the effectiveness of knowledge translators [33,40,41] and highlighted the effectiveness of the strategy against other knowledge translation strategies [137] or no intervention [140].

3.3.4.7 Educational meeting

Refers to the participation of health care providers in conferences, lectures, workshops or internships. They are commonly used, with the main cost related to time off for health professionals and are generally viable in most situations [21]. In a high-quality systematic review [36], two studies have shown results for primary health care [141,142].

3.3.4.8 Reminder

Two systematic reviews[34,35], the first with 20 studies[143-162] and the second with 11 studies[163-173], investigated the use of reminders as defined as any intervention, manual or computerized, which prompts the health care provider to perform a clinical action. Effectiveness of reminders as part of multifaceted interventions and indicated some degree of positive change in improving professional practice.

3.3.4.9 Facilitation of practice

Facilitation of practice is a approach whereby qualified individuals, internal or external to a primary care setting, promote the adoption and use of evidence-based guidelines[21]. A review[37] assessing the effects of facilitating practice on evidence-based practices identified 23 studies[174-196]. They all occurred in high-income countries. It has been found that using practice facilitation probably improves the adoption of evidence-based guidelines.

3.3.4.10 Multifaceted Intervention

Multifaceted interventions can be defined as any intervention that combines two or more strategies to disseminate or implement evidence in clinical practice. A meta-analysis[30], consisting of 18 studies[197-214], demonstrated a wide range of interventions aimed at implementing guidelines in the primary care setting. Single-component interventions were more effective compared to multifaceted interventions in improving the care process and care outcome.

3.3.5 Data validation with study authors

The authors of the included studies were contacted to validate data extraction. Overall, eight responses (61.5%) were obtained from the corresponding authors.

3.3.6 Methodological quality of systematic reviews and quality of evidence

Most reviews presented critically low methodological quality [30-32,34,37,39]. Four of them presented high methodological quality [35,36,38,41] (Table 2). Almost all studies conducted a comprehensive bibliographic search and evaluated the methodological quality of primary studies. However, only four studies assessed the likelihood of publication bias[30-32,37] and five provided lists of included and excluded studies [30,35,36,38,41]. No systematic review was excluded due to poor methodological quality.

Regarding the quality of evidence, the main outcome was evaluated using the GRADE approach, which presented very low quality of evidence [30-32,35,37-41] and low quality of evidence [33,34,36,42].

3.4 DISCUSSION

3.4.1 Summary and applicability of the main findings

The results of this overview indicate that there is a growing body of evidence investigating the effectiveness of knowledge translation strategies in the context of primary care. Many studies lack rigor in their methodology and risk substantial bias. There is also a lot of variability in studies in this field. The thirteen reviews included highlight the small effects of unique interventions such as audit and feedback, reminders and opinion leaders. Educational visits improved prescribing but had variable effects on other practices. Knowledge brokering does not appear to be effective in promoting evidence-based decision making. Multifaceted interventions were no more effective than single interventions but are often used to promote the use of research in practice, with a reliance on

educational interventions. This fact can be justified since professionals respond unequally to different types of interventions.

None of the results were considered to have the confidence of moderate or high evidence. The main reasons for this may be the heterogeneity of the studies, the variability of the results and the potential for bias in the studies. Thus, although studies show positive results of knowledge translation strategies in the context of primary care, these results are generally not a reliable indication of the likely effect. The likelihood that the effect will be substantially different is very high.

Variability was observed in the areas of clinical practice, the intervention strategies used and the results, despite remaining focused on the primary care setting. Other reviewers in the science of implementation have found similar variability. A systematic review, which looked only at the implementation of clinical asthma protocols, found inconsistent data in the results [215]. Overall, there was limited success in identifying consistently effective knowledge translation interventions. Partly this can be attributed to the general lack of theory-driven knowledge translation interventions[1.] A theoretical approach offers the advantage of a generalizable framework for: informing the development and implementation of interventions; guide the assessment; explore moderating factors and causal mechanisms; and facilitate a better understanding of the generalization and replicability of knowledge translation interventions[1.]

3.4.2 Comparison with the literature

We identified four overviews related to knowledge translation strategies[216-219]. These overviews addressed a range of disease strategies, conditions, and behaviors in diverse contexts and populations. Like our overview, most of the included studies were from high-income countries, and data on outcomes and cost-effectiveness were scarce. We describe the conclusions of the four overviews below.

An overview[216] included 26 reviews and assessed the effectiveness of the tools to change clinicians' clinical practices and improve patient health outcomes. The results showed that interactive interventions (audit / feedback, academic detailing and reminders) were most effective at simultaneously altering medical

care and patient outcomes. Opinion leaders were considered less effective. The distribution of printed information had little or no beneficial effect on changing medical practice. Most of these findings agree with our overview.

Another overview [217] examined the effectiveness of health system arrangements and knowledge translation strategies. Five reviews evaluated strategies for changing behavior or professional performance. The strategies evaluated were dissemination of guidelines, auditing and feedback, educational awareness visits and educational meetings. These interventions have resulted in small to moderate (but important) improvements in professional performance and health outcomes. Although these authors use a slightly different classification from that used in this overview, the results were relatively similar, with only minor changes related to the updated versions of some revisions [29,30,39].

Some authors [218] evaluated the effectiveness of interventions aimed at changing standards of medical practice by implementing clinical research findings and clinical guidelines in surgical settings. They identified some strategies, namely: audit and feedback, computerized decision support systems, local opinion leaders, patient-mediated interventions, reminders, and multifaceted interventions. Active approaches, such as educational visits, have led to greater effects than traditional passive approaches, such as printed educational material.

Chan et al [219] evaluated the effectiveness of strategies to improve the adoption of clinical practice guidelines focusing on four interventions: reminders, educational visits, audit and feedback, and supplier incentives. The overview included 55 studies, 39 systematic reviews and 16 review overviews. Using vote counting, the authors found that audit and feedback and educational visitation were generally effective in improving the care process and clinical outcomes; provider incentives have shown mixed effectiveness in improving care processes and clinical outcomes; and reminders showed mixed effectiveness in improving care process outcomes and were generally ineffective for clinical outcomes. These findings are like those found in our overview of the effectiveness of audit and feedback and educational visit strategies[31,39]. On the other hand, our findings on the effects of reminders on professional are more positive [34,35], possibly due to differences in the settings where reminders were evaluated.

5.4.3 Strengths and limitations

To our knowledge this is the first overview investigating strategies for knowledge translation in the context of primary care. This overview has methodological cautions such as extensive study research on key databases and gray literature. However, knowledge translation is a growing field with many terms to describe it [220], which makes it possible that we have missed some relevant articles. Our research strategy and study selection process followed systematic review methods and we are confident that this overview provides a representative range of knowledge translation literature in the primary care setting.

There are some restrictions on conducting an overview of systematic reviews. There are considerations about the exposure of individual studies included in the included analyzes. In this overview, we verify this and discover little overlap. Of the 176 primary studies, there were only five duplications, one study [137] in three reviews [33,40,41] and two studies [72,73] in two reviews [38,41]. In the analysis overview, it is unlikely that the selected studies have been published in recent years, data that were published in an original article and then used and included in a published review. Therefore, an analysis review is less likely to include the latest research. This may have specific implications for the use of new technologies, such as electronic reminders for doctors.

Many studies have reported conflicting results or consisted of low methodological quality and / or small studies, which made clear conclusions impossible. The strategies used to minimize this were the quality gradation of the obtained results. Several systematic reviews were excluded because they were not explicit in their inclusion criteria that the selected studies were focused on promoting the use of evidence in practice. Others were excluded because they were not explicit in the main body of the text that the systematic review was focused on promoting the use of evidence in practice. These omissions may be related to reporting bias, not to systematic reviews themselves.

3.5 CONCLUSION

This overview summarizes the available evidence on the effectiveness of knowledge translation strategies for primary health care professionals. A broad set of results related to changes in professional practice have been reported. The results point to small effects of unique interventions such as audit and feedback, educational visit, reminders, and opinion leaders. However, these results should be interpreted with caution given the great heterogeneity and low methodological quality the studies.

There is a clear need for high quality intervention studies to improve the uptake of research in practice and, in turn, health outcomes. Ideally, they should be comparative cohort studies or cluster randomized controlled trials, where possible, and follow accepted quality criteria for systematic reporting, with clear description of methods for intervention development and outcomes.

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3.8 CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

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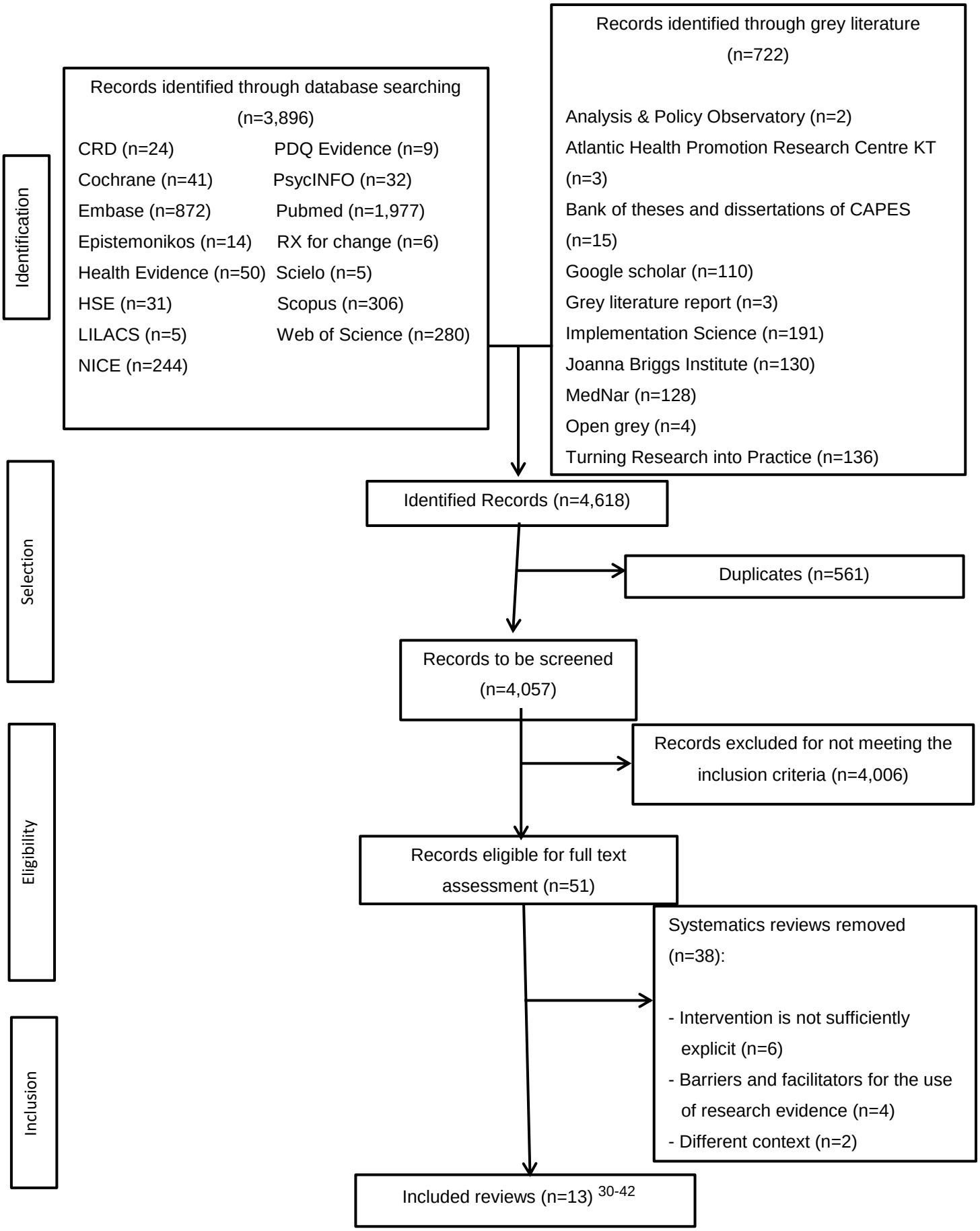

Figure 1. Flowchart of study selection process.

TABLES

Table 1. Main characteristics of the review included in the overview.

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Kovacs et al, 2018[30] RCTs (14), CAD (3) and nonrandomized study (1) Australia (3), Canada (3), Denmark (1), Spain (4), USA (2), Norway (3), Sweden (1) and United Kingdom (1)	Evaluate the effectiveness of implementation strategies for adherence to NCD guidelines in primary health care	SR and meta-analysis **Search date**: April 1, 2019 **Datatabe**: Medline and Embase **Participants:** Primary Health Care Providers **Outcomes**: All measures of the care process (prescription, diagnostic behavior, patient counseling, and knowledge transfer)	**Unique interventions:** - educational meeting - reminder - passive distribution of guideline - educational meetings audit - motivational interview **Multifaceted Interventions:** **-** distribution of materials + disclosure visit + reminders - educational meetings + distribution / + outreach visit / + visit + audit / + distribution of materials - proximity visit + audit + practice facilitation	Meta-analysis revealed an overall effect size of 0.22 (95% CI 0.15 - 0.29), where single interventions were more effective (DM 0.27; 95% CI: 0.17 - 0.38) than multifaceted. (DM 0.13; 95% CI: 0.06 - 0.19). **Knowledge transfer** showed the greatest improvement (DM 0.39; 95% CI 0.05-0.73) [197-199], **diagnostic behavior** detected positive effect (0.22; 95% CI 0.14, 0.31) [200 -208], as well as in **patient counseling** (DM: 0.30; 95% CI: 0.14-0.45) [209.] However, there was no significant improvement over **medical prescription** (DM 0.11; 95% CI - 0 .01, 0.24) [210-214]. The similar success rate was observed for educational meetings with 67% of indicators being effective (MD: 0.18; 95% CI 0.06-0.31) and multifaceted interventions combining more than two methods (with 65% of indicators being effective). (DM 0.11; 95% CI 0.01-0.20) In contrast, the least effective method was the passive distribution of.	⊕⊕⊕⊖ Low Inclusion was restricted to studies published in English or German and to developed countries.
Tuti et al., 2017 [31] RCTs (5) USA (1), Australia (1), Sweden (1), Denmark (1), Netherlands (1)	Evaluate the effectiveness of audit and feedback interventions in a primary care setting	SR and meta-analysis **Search date:** August 2016 **Datatabe:** Medline, EMBASE, Cochrane Library **Participants:** health professionals **Outcomes:** health care processes	Audit and feedback x no intervention	The intervention group showed improved practice when compared to the non-intervention group (OR: 1.93; 95% CI: 1.36–2.73) [125-130]	⊕⊕⊖⊖ Low Did not include gray literature

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Grudniewicz et al., 2015 [32] RCTs (21) USA (5), United Kingdom (4), Canada (5), Australia (1), Germany (1), Netherlands (1), Denmark (1), Switzerland (1), Norway (1) and Italy (1)	To investigate the effectiveness of printed educational materials in improving medical knowledge and behavior and outcomes of primary care patients	SR and meta-analysis **Search date:** Until November 2014 **Database**: Medline, EMBASE, Cochrane Library, ERIC (ProQuest) **Participants:** health professionals **Outcomes:** Change of Practice	Printed educational materials x no intervention or workshop	**1) PEM x no intervention** Results were not statistically significant for: - Continuous outcomes for medical behavior (4 RCTs, 531 physicians) [84-87]: MD = 0.35; 95% CI = -0.06, 0.76; I^2 = 67.88% - Continuous outcomes for medical behavior per patient (3 RCT, 1106 patients) [88-90]: DM = 0.27; 95% CI = -0.03, 0.57, I^2 = 68.74% - Dichotomous outcomes for medical behavior (3 RCT, 999 physicians) [91-93]: RR = 1.01; 95% CI = 0.96, 1.07, I^2 = 0.00% - Dichotomous outcomes for medical behavior per patient (9 RCT, 3,273,788 patients) [94-102]: RR = 0.99; 95% CI = 0.97, 1.01; I^2 = 0.00% **2) PEM x workshops** Results were not statistically significant for: - Dichotomous behavioral outcomes (2 RCTs, 153,089 patients) [103-104] RR = 0.57; 95% CI = 0.12-2.73; I^2 = 64.48%)	⊕⊕⊖⊖ Low
Bornbaum et al., 2015[33] CAD (1), RCT (1) Canadá (2)	Systematically gather evidence on the effectiveness of knowledge brokers in primary health contexts	SR **Search date:** until november 2014 **Datatabe:** MEDLINE, Embase, PsycINFO, CINAHL, ERIC, Scopus, SocINDEX and Health Business Elite and relevant sources of gray literature **Participants:** health professionals in a community health environment **Outcomes:** Change of practice	Knowledge broker x no intervention Knowledge broker + access to an RS database + personalized messages x access to an RS database x Access to an RS database + custom messages	Among the studies, two evaluated the effectiveness of knowledge translators and produced conflicting results about the effectiveness of the knowledge broker: **1) Knowledge broker x no intervention** One study found that a knowledge broker in a clinical setting is more effective at increasing self-reported knowledge and the use of guidelines when compared to no intervention[140]. **2) Knowledge broker + access to an SR database + personalized messages x access to an SR database x Access to an SR database + personalized messages** [137] MP: The third group showed a significant improvement in strategies for healthy weight in children when compared to the other groups (DM: 1.38; 95% CI: 1.05.1.81; p <0.01). Measurement period: baseline and end of intervention (two years)	⊕⊕⊖⊖ Low Did not include gray literature

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Watkins et al., 2015[34] RCTs (11), CAD (9) Australia (6), USA (4), United Kingdom (3), Netherlands (2), Belgium (1), Canada (1), Finland (1), Germany (1) and Switzerland (1)	Synthesize the literature on the effectiveness of dissemination strategies and implementation of clinical guidelines for community pharmacies.	SR **Search date**: Until November 2014 **Datatabe:** Medline, EMBASE, CINAHL, Web of Science, Informit, Cochrane Library **Participants:** health professionals in a community health environment **Outcomes:** Improvement of professional Practice	Reminders as part of multifaceted strategies	**Sixteen studies involved multifaceted interventions. Among these, three showed no differences between the groups:** 1) Distribution of educational materials to support policy-based practice + educational visits + media campaign + reminders x no intervention[143] 2) Educational materials + educational meetings + reminders + x no intervention[144] 3) Educational materials + educational meetings + reminders x no intervention[145] **Thirteen studies out of sixteen with multifaceted interventions showed greater efficacy to the intervention group compared to no intervention:** 1) Guidelines disseminated by mail or email + reminders x no intervention [146] 2) Educational meetings + reminders + audit and feedback + reminders x no intervention[147] 3) Educational meetings + audit and feedback + reminders x no intervention[148-150] 4) Educational materials + educational visits + + practice support reminders x no intervention[151,152] 5) Reminder + practice support x no intervention[153] 6) Educational materials + educational visits + reminders x no intervention[154] 7) Educational meetings + audit and feedback + reminders x no intervention[155] 8) Educational materials + reminders x no intervention[156] 9) Educational materials (distribution of educational materials to support policy-based practice (paper, electronic, patient-focused, practical tools), disseminated by mail, e-mail or in person) x no intervention[157,158] **Single intervention strategies were used in four studies that indicated greater effectiveness for the intervention group:** 1) Practice support (follow-up contact (eg, visits or phone calls) to provide motivation and support for post-education professionals) + reminders x no intervention[159] 2) Educational materials + reminders x no intervention[160,161] 3) Educational meetings + reminders x no intervention[162]	⊕⊕⊖⊖ Low

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Mccormack et al., 2013[35] ECRs (11) Canadá (3), Reino Unido (3), Estados Unidos (1), Austrália (1), Holanda (1), Escócia (1) e Espanha (1)	Analyze how best to disseminate evidence to inform health-related decisions	SR **Search date:** 2000 to march and april 2013 **Datatabe:** MEDLINE®, Cochrane Library, Cochrane Central Trials Registry, PsycINFO®, and Web of Science **Participants:** health professionals **Outcomes:** Improvement of professional Practice	**Motivation strategies:** Interpersonal telephone counseling **Skills strategies:** Computer learning, textbooks, and academic detailing **Reach Strategies:** Delivering guidelines via mail or email **Multifaceted Strategies:** Combining two or more strategies	**1) reach strategies vs. capacity strategies** **-** Guideline in computerized version x textbook format = did not differ significantly [163] - Mail directive x individual academic breakdown x group academic breakdown = did not differ significantly[164] - Guideline via mail x PEM via mail + audit and feedback x computer-assisted learning = did not differ significantly[165] - Mail vs. Web Guideline = no significant differences between groups[166] **2) strategies for reach x strategies for motivation** - Printed material x specific patient ratings on vignettes = the second group was significantly more effective than the first[167] **3) strategies for reach x multicomponent strategies** **-** Guideline via mail x educational meeting + brochure or pamphlet [168] = the second group was significantly more effective than the first - Guideline via email x educational meeting + reminder [169] = the second group was significantly more effective than the first **4) skill strategies x multicomponent strategies** **-** continuing medical education x practice reinforcers + multicomponent (media + postcard + reminder + social media) [170] = the second group was significantly more effective than the first - evidence-based medicine workshop + decision tree support x decision tree alone or workshop alone = no significant differences between groups[171] **5) motivation strategies x multicomponent strategies** - talk by opinion leader x talk by opinion leader + academic detailing + toolkit = the second group was significantly more effective than the first[172] **6) reach and skill strategies x multicomponent strategies** - Mail directive x directive + educational meeting x directive + educational meeting + continuing medical education = did not differ significantly[173]	⊕⊕⊖⊖ Low - Restricted bibliographic searches: articles published in English from 2000 until March 2013, except for studies on communicating uncertainty, for which all post-1966 studies were considered
Ospina et al., 2013[36] RCTs (2) Mexico (1) and Canada (1)	Evaluate knowledge translation interventions that lead to evidence capture in practice	SR **Search date:** until september 2011 **Database:** The Cochrane Library, MEDLINE, EMBASE, Sociological Abstracts, SocINDEX, Social Services Abstracts, ABI Inform, Health evidence, KT Library	Interactive Educational Meeting x passive educational meeting Distribution of educational materials + educational meetings x usual practice	Of the 18 studies, 13 evaluated knowledge translation interventions aimed exclusively at health professionals, among them, 2 studies were in the context of primary care. Both studies reported statistically significant effects on the medium-term adequacy of prescribing behaviors among health providers **1) Interactive Educational Meeting vs. Passive Educational Meeting**[141]: DM 15.0; 95% CI 14.4 - 16.3 **2) Distribution of educational materials + educational meetings + educational visit + mass media x usual practice**[142]: DM 1,2; 95% CI 1.4 - 1.6	⊕⊕⊖⊖ Low - High variation in interventions and outcome measures

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Baskerville et al., 2012 [37] RCTs (20) and nonrandomized studies (3) USA (7), Netherlands (2), Canada (6), United Kingdom (5), Australia (3)	Evaluate the effect of practice facilitation on professional behavior	SR and meta-analysis **Search date**: until february 2011 **Database**: MEDLINE, Thomson Scientific Web of Scienc, Science Citation Index, Social Sciences Citation Index and Arts and Humanities Citation Index **Participants:** health professionals in primary care settings **Outcomes:** change in knowledge and professional practice	Facilitation of practice x no intervention	Primary care professionals are 2.76 (95% CI: 2.18-3.43) times more likely to adopt evidence-based guidelines by facilitating practices when compared to no intervention. Meta-regression analysis indicated that adaptation (P = 0.05), intervention intensity (P = 0.03), and number of intervention practices per facilitator (P = 0.004) changed the adoption of guidelines based on in evidence[174-196]	⊕⊕⊖⊖ Low - The review did not include studies conducted in low-income countries. - Practical facilitation can be difficult to implement in resource-poor environments.
Giguére et al., 2012 [38] RCTs (10), STI (31) Australia (5), Canada (9), United Kingdom (7), Spain (2), Belgium (1), Netherlands (1), Finland (2), Ireland (1), Germany (1), Italy (1) , Japan (1), US (11)	To evaluate the effects of printed educational materials on improving professional practice and patient health outcomes	SR **Search date:** until june 2011 **Database:** MEDLINE, EMBASE, CENTRAL, HealthStar, ERIC, CAB Abstracts, Global Health and EPOC **Participants:** health professionals and patient health outcomes **Outcomes:** Change in professional practice	Printed educational materials x no intervention or same document in CD-ROM	When used alone and compared to control without intervention, PEM can have a small beneficial effect on professional practice outcomes. Ten studies evaluated the effectiveness of strategies in primary care practices 1**) PEM x no intervention** [43-49] The absolute risk difference was 0.02 larger (range 0.00 to 0.11) **2) MEI x same document released on CD-ROM** [81-83] Standardized mean difference across multiple outcomes was 0.13 higher (range 0.16 to 0.36) **3) PEM** (31 STI) [50-80] Overall improvement in professional practice outcomes between studies immediately after MEI introduction, with a standardized median change at the 1.69 level (range from -6.96 to +14.26)	-⊕⊕⊖⊖ Low The reviewed studies were mainly in high-income countries.

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Ivers et al., 2012[39] RCTs (21) USA (9), Canada (8), United Kingdom (3), Ireland (1)	Evaluate the effects of auditing and feedback on health professional practice and examine factors that may explain the variation in audit and feedback effectiveness.	SR **Search date:** until september 2011 **Database:** Medline, Cinahl, EMBASE, Cochrane Library, Cochrane Effective Practice Group and Organization of Care, Science Citation Index and Social Sciences Citation Index, ISI Web of Science **Participants:** health professionals **Outcomes: c**hange in practice	Audit and feedback x no intervention	Auditing and feedback can be a useful intervention to improve health professionals' compliance with desired practice. The mean adjusted risk difference was an absolute increase of 1.3% (IQR 1.3% to 28.9%) in the compliance of professionals with the desired practice in relation to the control group[105-125]	⊕⊕⊖⊖ Low Inclusion has been restricted to studies published in english.
LaRocca et al., 2012[40] RCTs (4) and ITS (1) USA (2), Canada (1), Norway (1) and United Kingdom (1)	Evaluate the effectiveness of knowledge translation strategies used to promote evidence-based decision making in the public health context	SR **Search date:** 2000 to 2010 **Database:** Medline, Cinahl, EMBASE, Cochrane Library, manual search in online databases, gray literature **Participants:** health professionals in a community health environment **Outcomes:** change in practice, knowledge or decision-making ability based on scientific evidence	**Educational sessions:** workshop, information services, discussion forums, free access to databases **Technical Support:** communities of practice, knowledge broker, online rs database access **Dissemination channels:** printed educational materials, CD-ROM and internet	- Online access to information and training workshop + newsletters x free access to various library databases [139] Change knowledge: After the intervention, participants in the first group showed greater improvement in self-perception of knowledge (DM: 0.4, 95% CI 0.2-0.6; p <0.001) and importance for critical evaluation of a study (DM: 0.2, 95% CI 0.0-0.3; p = 0.01) Change in practice / MH: No differences between groups (statistical test not reported) -Interactive educational meeting (didactic presentation + discussion + real-life vignettes) x usual practice [134] Change knowledge/change in practice: No differences between groups in adherence to a clinical guideline (statistical test not reported) -Community practice x practice communities [133] Change knowledge: There is no difference between the groups (p = 0.14). Change in practice: There were no differences between groups (p = 0.65) - Access to an SR database x Access to an RS database + personalized messages x Access to an SR database + personalized messages + a knowledge broker[137] MP: The second group showed a significant improvement in strategies for healthy weight in children when compared to the other groups (DM: 1.38; 95% CI: 1.05.1.81; p <0.01). Measurement period: baseline and end of intervention (two years) - Printed educational materials x CD-ROM x internet channels[138] Change knowledge: At 6 months of follow-up, respondents who received materials disseminated via CD-ROM or the Internet showed greater knowledge about drug prevention programs among young people compared to respondents who received PEM (p <0.05).	⊕⊕⊖⊖ Low - English language limit - The included primary studies were of moderate quality. Most had small sample size - High variation in settings, interventions, and outcome measures in included studies - It is difficult to determine if the knowledge translation strategy itself was effective or if it was the context

Systematic review / region / included studies and designs	Objective	Methods	Interventions x comparisons	Main results	Quality of evidence (GRADE)
Murth *et al*., 2012[41] RCTs (2) e ITS (2) Canada (1), United Kingdom (2), Thailand (1) and Mexico (1)	Identify and evaluate the effects of information products based on the results of systematic reviews to support the adoption of evidence by health decision makers.	SR **Search date:** 1992 to March 2011 **Database:** Cochrane Library, Medline, EMBASE, Cinah, Web of Science and Helath Economic Evaluations Database, Cochrane Colloquium Abstracts, Gray Literature **Participants:** health decision makers, health system managers or policy makers **Outcomes:** any measure of research use in health decision making	1) Access to a specialized health library + interactive workshops x no intervention 2) Disclosure of RS-based health care bulletins without control group 3) Providing an informative summary of the results of a Cochrane review x the no summary review	**1) Access to a reproductive health library + interactive grassroots training x no intervention** [135] - Within 4-6 months, there was a statistically significant change in one of six clinical practices (DM: 5.3%, 95% CI -0.1% to 10.7%, p = 0.05) **2) Disclosure of RS-based health care bulletins x no control group** -The average annual decline in (misguided) clinical practice was significantly greater after the intervention (-10.1%, 95% CI -7.9% to -12.3%) than the 1.6% annual decline (CI). 95% -3.9% to 0.8%) before the intervention [72] Antidepressant prescriptions were estimated to be 8.2% lower (p = 0.005) than predicted by pre-intervention prescription rates [73] **3) Providing a Summary Table of the Results of a Cochrane Review x the Table-Free Review** [136] - Participants in the first group were more likely to "agree" that finding results for important outcomes were easier than participants in the second group: - 68% x 40% (p = 0.021) - Participants who had the summary table were more likely to correctly answer two outcome questions than those who did not have the summary table: 93% x 44% (p = 0.003) and 87% x 11% (p <0.001) **4) Access to an RS database x Access to an RS database + personalized messages x Access to an RS database + personalized messages + a knowledge broker** [137] -The second group showed a significant improvement in strategies for healthy weight in children when compared to the other groups (DM: 1.38; 95% CI: 1.05.1.81; p <0.01).	⊕⊕⊖⊖ Low - The number of studies evaluating each strategy is low. - Study samples are small - High heterogeneity between studies regarding types of interventions and measurements
Flodgren *et al.,* 2011[42] RCTs (2) Canada (2)	Assess the effectiveness of opinion leaders to disseminate and implement evidence in professional practice	**Search Date:** until may 2009 **Database:** MEDLINE, EMBASE, HMIC, ISI Conference Proceedings, Science Citation Index, Social Science Citation Index **Participants:** health professionals **Outcomes:** Clinical practice	Opinion leaders (alone or as part of multifaceted intervention) x no usual intervention or practice	**1) Opinion leaders + brief telephone advice on a guideline + guideline sent by fax or mail x provision of printed educational material**[131] The intervention group had significantly higher rates of osteoporosis treatment (22% x 7%) and bone mineral density testing (52% x 18%) within 6 months. **2) Opinion leader x no intervention**[132] The influence of local opinion leaders can be helpful in improving prescription quality in cardiovascular conditions (RR RR 1.32: 95% CI 1.03-2.40)	⊕⊕⊖⊖ Low - The number of studies evaluating each strategy is low

USA: United States of America; RCT: randomized clinical trial; STI: interrupted time series; SR: systematic review; MD: mean difference; 95% CI: 95% confidence interval;CRD: Center for Reviews and Dissemination; HSE: Health Systems Evidence; LILACS: Latin American and Caribbean Health Sciences Literature. RR: relative risk; PEM: printed educational material; OR: odds ratio; IQT: interquartile range; GRADE: Grading of Recommendations, Assessment, Development and Evaluations

Table 2. Quality assessment of the included systematic reviews.

Systematic Reviews	AMSTAR itens																Overall confidence in results
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Kovacs et al., 2018[30]	S	S	S	PS	S	S	N	PS	N	S	S	S	N	S	S	S	Critically low
Tuti et al., 2017[31]	S	S	S	PS	S	S	N	PS	N	S	S	S	N	S	S	S	Critically low
Grudniewicz et al., 2015[32]	S	S	S	PS	S	S	N	PS	N	S	S	S	N	S	S	S	Critically low
Borboaum et al., 2015[33]	S	S	S	PS	S	S	N	S	S	S	NO	NO	S	S	NO	S	Moderada
Watkins et al., 2015[34]	S	S	S	PS	S	S	N	PS	N	S	S	S	S	S	S	S	Critically low
Mccormack et al., 2013[35]	S	S	S	S	S	S	S	S	S	S	NO	NO	S	S	S	S	High
Ospina et al., 2013[36]	S	S	S	S	S	S	S	S	S	S	NO	NO	S	S	S	S	High
Baskerville et al., 2012[37]	S	S	S	PS	S	S	N	PS	N	S	S	S	S	S	S	S	Critically low
Giguère et al., 2012[38]	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	High
Ivers et al., 2012[39]	S	S	S	PS	S	S	N	PS	N	S	S	S	S	S	S	S	Critically low
LaRocca et al., 2012[40]	S	S	S	PS	S	S	N	S	S	S	NO	NO	S	S	NO	S	Moderate
Murth et al., 2012[41]	S	S	S	S	S	S	S	S	S	S	NO	NO	S	S	S	S	High
Flodgren et al., 2011[42]	S	S	S	PS	S	S	N	PS	N	S	S	S	S	S	S	S	Critically low

N: no; NO: No meta-analysis performed; PS: Partly yes; S: yes. AMSTAR items: 1. Do the research questions and inclusion criteria for the review include the PICO components? 2. Did the review report contain an explicit statement that the review methods were established prior to the review and did the report justify any significant deviations from the protocol? 3. Did the review authors explain their selection of study designs for inclusion in the review? 4. Did the review authors use a comprehensive literature search strategy? 5. Did the review authors select the study in duplicate? 6. Did the review authors perform duplicate data extraction? 7. Did the review authors provide a list of excluded studies and justified the exclusions? 8. Did the review authors describe the included studies in adequate detail? 9. Did the review authors use a satisfactory technique to assess the risk of bias in individual studies that were included in the review? 10. Did the review authors report sources of funding for the studies included in the review? 11. If a meta-analysis was performed, did the review authors use appropriate methods to statistically combine results? 12. If meta-analysis was performed, did the review authors assess the potential impact of risk of bias in individual studies on meta-analysis results or other evidence synthesis? 13. Did the review authors account for the risk of bias in the primary studies by interpreting / discussing the results of the review? 14. Did the review authors provide a satisfactory explanation and discuss any observed heterogeneity in the review results? 15. If they performed a quantitative synthesis, did the review authors conduct an adequate investigation of the publication bias (small study bias) and discussed its likely impact on the review results? 16. Did the authors of the review report any potential sources of conflict of interest, including any funding received for the review?

APPENDICES

Appendix 1. Registered in the International Prospective Register of Systematic Reviews (PROSPERO)

NIHR | National Institute for Health Research

PROSPERO
International prospective register of systematic reviews

Strategies for knowledge translation to change the behavior of primary health care professionals: an overview of systematic reviews

CRD42019135337

Keitty Regina C de Andrade, Mauricio G Pereira

Citation

Keitty Regina C de Andrade, Mauricio G Pereira. Strategies for knowledge translation to change the behavior of primary health care professionals: an overview of systematic reviews. PROSPERO 2019 CRD42019135337

Available from:

https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019135337

Review question

What methods of knowledge translation are used to change the professional behavior of primary health care?

How effective are the strategies used to disseminate research in primary health care?

What are the barriers and facilitators for the dissemination of research in primary health care?

What is the effectiveness of the strategies used to promote the implementation of research in primary health care?

What are the barriers and facilitators for the implementation of research in primary health care?

Searches

This overview uses systematic review methodology to locate and evaluate published systematic reviews regarding strategies for research knowledge translation, as dissemination and implementation.

We will search the following electronic sources: Health Evidence, Epistemonikos, PubMed, Web of Science, Scopus, Health Systems Evidence, Cochrane Database of Systematic Reviews, Centre for Reviews and Dissemination (CRD) (Database of Abstracts of Reviews of Effects - DARE and the Health Technology Assessment- HTA), Rx for change (CADTH), International Initiative for Impact Evaluation (3ie) database, as well as Google Scholar and Trip Database.

There will be no language restrictions and publication of status.

The search terms will be related to the “knowledge translation” (“implementation” and "dissemnation") and "primary health care" and they will be adapted according to the bibliographic databases.

Types of study to be included

Systematic reviews only will be included.

Condition or domain being studied

Strategies for translation of knowledge (dissemination and implementation) with the objective of altering professional behavior aiming at improving health services in primary care.

Participants/population

This study aims to find strategies for translation of knowledge within the primary health system at the professional level

Intervention(s), exposure(s)

Any strategy for knowledge translation

Comparator(s)/control

No intervention and another strategy for knowledge translation in primary health care

Context

Main outcome(s)

Strategies for knowledge translation for change assessed at the professional / process level (eg change in clinical practice or knowledge)

Timing and effect measures

Objective measures of change in health professional behaviour

Additional outcome(s)

None.

Timing and effect measures

None

Data extraction (selection and coding)

A standardized form will be used to extract data using the Cochrane Effective Practice and Organization of Care (EPOC) resources. This classification scheme is currently used by the Cochrane Collaboration and widely used by other researchers. Two authors independently extracted characteristics of the included studies: year of publication, economic situation of the country (low, middle or high income), source of funding, clinical area, study design, setting, study name, elements of knowledge translation. The number of components of the knowledge translation strategies mentioned in each study, the number of units targeted, the number of units covered, the timing of the expansion process and the structures / theories used will also be extracted.

Extracting data from eligible studies with their authors by email with a reminder via ResearchGate will be validated. Any divergence in the data extraction process will be resolved by consensus between the two reviewers and, if necessary, with a third party.

Risk of bias (quality) assessment

The quality of systematic reviews will be evaluated using the tool MeaSurement Tool to Assess Reviews (AMSTAR). Reviews that presented AMSTAR scores between 8 and 11 were considered high quality, scores between 4 and 7 of moderate quality and scores of less than 4 of low quality. These limits are commonly used by the Cochrane Collaboration. The quality assessment of the study will be used to interpret the results when synthesized in this overview and in the formulation of conclusions. This stage will also be carried out by two authors who will apply the criteria independently and the differences were resolved by consensus between the two reviewers, and when necessary a third.

Strategy for data synthesis

The main result of each study will be presented, if explicitly indicated in the article. To make the results comparable across studies, effect measures will be transformed into a common scale centered at zero, ie the absence of an intervention effect would be represented by a zero, a beneficial effect of the intervention by a value greater than zero and a detrimental effect, a value less than zero. Due to the heterogeneity of the included studies and their different results, a random effect model will be used instead of a fixed effect model to estimate a summary measure of the pooled results.

Regarding the transformation of measures of effect, for controlled before-after studies: for each study, effect size will be calculated as the ratio of the proportion of events after the intervention divided by the corresponding proportion in the control group, ie a ratio of 1.1 corresponds to a 10% increase in the intervention group compared to the control group and a ratio of 1.0 corresponds to no effect. This ratio will be
logarithmized to center the value around the null; for controlled trials: effects sizes will be calculated differences between groups in relation to post-intervention period. For each trial and each intervention, the effect size will be calculated as the intervention odds ratio to control. This relationship will be logarithmic to center the value around the null.
In addition, the gaps in the research evidence will also be identified by means of a matrix where each row corresponds to an intervention scheme and each column to an effect size category.
The initial phases of the review (trial screening and eligibility) will be managed through Covidence Software; data extraction and methodological quality assessment were managed by Excel (Microsoft Corporation, USA) and data analysis by stata.

Analysis of subgroups or subsets

If necessary, analysis of different levels in health systems

Contact details for further
information
Keitty Regina C de Andrade
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Organisational affiliation of the review

Universidade de Brasília

Review team members and their organisational affiliations

Mrs Keitty Regina C de Andrade.
Universidade de Brasília
Dr Mauricio G Pereira
University of Brazilia

Type and method of review

Overview

Anticipated or actual start date

16 October 2018

Anticipated completion date

31 July 2019

Funding sources/sponsors

Fundação de Apoio à Pesquisa do Distrito Federal

Conflicts of interest

None known

Language

English

Country

Brazil

Stage of review

Review Ongoing

Subject index terms status

Subject indexing assigned by CRD

Subject index terms

Health Personnel; Humans; Primary Health Care; Translational Medical Research

Date of registration in PROSPERO

18 October 2018

Date of publication of this version

18 October 2019

Details of any existing review of the same topic by the same authors Stage of review at time of this submission

Stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	Yes
extraction	Yes	No
Risk of bias (quality) assessment	Yes	No
Data analysis	Yes	No

Versions

18 October 2019

PROSPERO

This information has been provided by the named contact for this review. CRD has accepted this information in good faith and registered the review in PROSPERO. The registrant confirms that the information supplied for this submission is accurate and complete. CRD bears no responsibility or liability for the content of this registration record, any associated files or external websites.

Appendix 2. Preferred Reporting Items for Systematic Review and Meta-Analysis

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	92
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	92-93
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	94
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	94
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	95
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	95
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	95
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	96
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	96
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	96
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	97
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	97
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	97
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	97

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	97
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	97
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	98
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	97,98
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	97,98
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	99-104
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	104
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	104
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	104
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	105
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	107
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	108
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	109

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: **www.prisma-statement.org**.

Appendix 3. *Checklist Peer Review of Electronic Search Strategies (PRESS)*

SEARCH SUBMISSION: THIS SECTION TO BE FILLED IN BY THE SEARCHER

Searcher: Keitty RC Andrade Email: keittyregina@hotmail.com Date submitted: 9/14/2018 Date requested by: *[Maximum = 5 working*

Systematic Review Title:

Effectiveness of knowledge translation strategies aimed at primary health care decision makers: an overview of systematic reviews

This search strategy is …

X	My PRIMARY (core) database strategy — First time submitting a strategy for search question and database
	My PRIMARY (core) strategy — Follow-up review NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions
	SECONDARY search strategy— First time submitting a strategy for search question and database
	SECONDARY search strategy — NOT the first time submitting a strategy for search question and database. If this is a response to peer review, itemize the changes made to the review suggestions

Database

(i.e., MEDLINE,CINAHL…): *[mandatory]*

Medline

Interface

(i.e., Ovid, EBSCO…): *[mandatory]*

Pubmed

Research Question

(Describe the purpose of the search) *[mandatory]*

What are the most effective strategies for translating knowledge for primary health care?

PICO Format

P	health decision-makers (service providers, policy makers and managers) who have been targeted for knowledge translation in the context of primary care
I	knowledge dissemination or implementation strategies
C	No restrictions
O	Change assessed at professional / process level (eg, change in clinical practice or knowledge)
S	Systematic reviews with or without meta-analyzes

Inclusion Criteria

(List criteria such as age groups, study designs, etc., to be included) *[optional]*

Studies that evaluated the effectiveness of strategies for translating scientific knowledge into practice in the context of primary health care in the context of primary health care

Exclusion Criteria

(List criteria such as study designs, date limits, etc., to be excluded) *[optional]*

We excluded reviews that did not clearly report the strategy used for knowledge translation, could not extract separate data for primary health care, or compared strategies to “usual practice” without describing it.

Was a search filter applied?

Yes [ ] No [X]

If YES, which one(s) (e.g., Cochrane RCT filter, PubMed Clinical Queries filter)? Provide the source if this is a published filter. *[mandatory if YES to previous question — textbox]*

Other notes or comments you feel would be useful for the peer reviewer? ***[optional]***

Please copy and paste your search strategy here, exactly as run, including the number of hits per line. ***[mandatory]***

(“knowledge translation”[TIAB] OR “knowledge-translation”[TIAB] OR “know-do gap”[TIAB] OR “translational research”[TIAB] OR “translation evidence”[TIAB] OR “translating evidence”[TIAB] OR “translating research”[TIAB] “translational medical”[TIAB] OR “translational research”[TIAB] OR “evidence-based practice”[MeSH] OR “evidence-based practice”[TIAB] OR “evidence-based”[TIAB] OR “evidence based”[TIAB] OR “use of evidence” [TIAB] OR “evidence-informed”[TIAB] OR “evidence informed”[TIAB] OR “research evidence” [TIAB] OR “scientific evidence”[TIAB] OR "scaling up"[TIAB] OR "scaling-up"[TIAB] OR "scaled up"[TIAB] OR "scale up"[TIAB] OR spread[TIAB]) AND (“primary health care”[MeSH] OR “primary health care”[TIAB] OR “primary care”[TIAB]) AND (“meta analysis”[ptyp] OR meta-analysis[TIAB] OR meta-analysis[mh] OR (systematic[TIAB] and review[TIAB]) NOT ((case[ti] and report[ti]) OR editorial[ptyp] OR comment[ptyp] OR letter[ptyp] OR “newspaper article”[ptyp]))

PEER REVIEW ASSESSMENT: THIS SECTION TO BE FILLED IN BY THE REVIEWER

Reviewer: Ana Godoy	Email:	Date completed: 09/19/2018

1. TRANSLATION

A --- No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

2. BOOLEAN AND PROXIMITY OPERATORS

A --- No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

3. SUBJECT HEADINGS

A -- -No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

4. TEXT WORD SEARCHING

A ---No revisions	x
B --- Revision(s)suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

5. SPELLING, SYNTAX, AND LINE NUMBERS

A ---No revisions	x
B --- Revision(s)suggested	
C --- Revision(s) required	

If "B" or "C," please provide an explanation or example:

6. LIMITS AND FILTERS

A ---No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

If “B” or “C,” please provide an explanation or example:

OVERALL EVALUATION (Note: If one or more “revision required” is noted above, the response below must be “revisions required”.)

A ---No revisions	x
B --- Revision(s) suggested	
C --- Revision(s) required	

Appendix 4. Search strategy for each database and gray literature

Database	Strategies
CRD	((knowledge translation OR evidence-based practice OR translational research OR knowledge transfer OR knowledge exchange)) AND (population health or public health OR healthcare OR health-related)
Cochrane Database of Systematic Reviews	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”)
Embase	('knowledge translation' OR 'evidence-based practice'/exp OR 'evidence based medicine'/exp) AND 'primary health care'/exp AND 'systematic review'/exp AND [embase]/lim NOT [medline]/lim
Epistemonikos	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND ("primary health care" OR "first line" OR "primary care")
Health Evidence	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND ("primary health care" OR "first line" OR "primary care")
HSE	(“use of evidence” OR “evidence informed” OR “know-do gap” OR “knowledge translation”) AND "primary health care" OR "first line" OR "primary care"
LILACS	(tw:((use of evidence) OR (evidence informed) OR (know-do gap) OR (uso de evidência) OR (informada por evidência) OR (knowledge translation))) AND (tw:((primary health care) OR (atenção primária à saúde))) Filter: systematic_reviews
NICE	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine") AND "primary health care" Filter: Secondary evidence
PDQ Evidence	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR “first line” OR “primary care”) Filter: systematic review
PsycINFO	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR “first line” OR “primary care”) and "systematic review"
PubMed	("knowledge translation"[TIAB] OR "knowledge management"[TIAB] OR "knowledge-translation"[TIAB] OR “knowledge transfer” [TIAB] OR "know-do gap"[TIAB] OR “knowledge brokering”[TIAB] OR “knowledge exchange”[TIAB] OR “knowledge mobilization”[TIAB] OR dissemination OR implementation OR “implementation research”[TIAB] OR “implementation science”[TIAB] OR “implementation methods”[TIAB] OR “research implementation”[TIAB] OR “implementation gap”[TIAB] OR "translational research”[TIAB] OR "translation evidence”[TIAB] OR "translating evidence”[TIAB] OR "translating research”[TIAB] OR "translational medical research”[Mesh] OR “Evidence-informed decision-making”[TIAB] OR “evidence transfer”[TIAB] OR "use of evidence”[TIAB] OR "evidence-informed”[TIAB] OR "evidence informed”[TIAB] OR "research evidence”[TIAB] OR "scientific evidence”[TIAB]) AND (“Physicians, Family”[Mesh] OR “Family Practice”[Mesh] OR “General Practitioners”[Mesh] OR “General Practice”[Mesh] OR “Primary Health Care”[Mesh] OR "primary health care"[TIAB] OR "primary care”[TIAB] OR “first-line health services”[TIAB] OR “primary healthcare”[TIAB]) Filter: review

RX for change	("knowledge translation" OR “knowledge transfer” OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine") AND "primary health care"
Scielo	(("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”)) Filter: review
Scopus	((knowledge translation OR knowledge transfer OR translation evidence OR evidence-based practice) AND (primary health care OR primary care))
Web of Science	(("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”)) Filter: review
Gray literature	
Analysis & Policy Observatory	Knowledge translation
Atlantic Health Promotion Research Centre KT Library	"knowledge translation"
Bank of theses and dissertations of CAPES	"tradução do conhecimento"
Google scholar	allintitle: ("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care")
Grey literature report	"knowledge translation"
Implementation Science	"knowledge translation"
Joanna Briggs Institute	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”)
MedNar	"knowledge translation" ("primary care" OR "first line")
Open grey	"knowledge translation"
ProQuest dissertations and theses	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”) AND “systematic review”
Turning Research into Practice	("knowledge translation" OR “knowledge transfer” OR "know do gap" OR "translation evidence" OR "evidence-based practice" OR "evidence-based medicine" OR “use of evidence” OR “evidence informed”) AND ("primary health care" OR "primary care" OR “first line”) Filter: systematic reviews

CRD: Centre for Reviews and Dissemination; EMBASE: Excerpta Medica dataBASE; HSE: Health Systems Evidence; LILACS: Literatura Latino-americana e do Caribe em Ciências da Saúde; NICE: Nacional Institute for Health and Care Excellence Evidence Search;

Appendix 5. Email sent regarding data extraction validation**.**

Dear Dr. “name of corresponding and/or first author”,

Hoping this email finds you well.

I am a doctoral researcher in Knowledge Translation under the supervision of Dr Mauricio Gomes Pereira. We are currently conducting an overview entitled "Effective interventions for knowledge translation in primary care: an overview of systematic reviews".

Your article titled “Title of publication” has been identified for inclusion in our review. We would be most grateful if you could validate the extraction we have performed of your study, correcting any inaccuracies and providing any missing information (see attached document). This should not take you more than a few minutes of your time and will ensure appropriate representation of your work.

We would appreciate if you could let us know by January 31th 2019. Please don’t hesitate to contact us for further details.

Thank you very much for your help,

Keitty Regina Cordeiro de Andrade

Appendix 6. Excluded articles and reasons

Intervention is not sufficiently explicit	
1	Guldberg TL, Lauritzen T, Kristensen JK, Vedsted P. The effect of feedback to general practitioners on quality of care for people with type 2 diabetes. A systematic review of the literature. BMC Fam Pract. 2009; 10:30.
2	Hysong SJ. Meta-analysis: audit and feedback features impact effectiveness on care quality. Med Care. 2009;47(3):356-63.
3	Knaup C, Koesters M, Schoefer D, Becker T, Puschner B. Effect of feedback of treatment outcome in specialist mental healthcare: meta-analysis. Br J Psychiatry. 2009;195(1):15-22.
4	Pearson SA, Moxey A, Robertson J, Hains I, Williamson M, Reeve J, et al. Do computerised clinical decision support systems for prescribing change practice? A systematic review of the literature (1990-2007). BMC Health Serv Res. 2009; 9:154.
5	Schedlbauer A, Prasad V, Mulvaney C, Phansalkar S, Stanton W, Bates DW, et al. What evidence supports the use of computerized alerts and prompts to improve clinicians' prescribing behavior? J Am Med Inform Assoc. 2009;16(4):531-8.
6	Shojania KG, Jennings A, Mayhew A, Ramsay CR, Eccles MP, Grimshaw J. The effects of on-screen, point of care computer reminders on processes and outcomes of care. Cochrane Database Syst Rev. 2009(3):CD001096.
Barriers and facilitators for the use of research evidence	
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CONSIDERAÇÕES FINAIS

A partir da pesquisa apresentada nesta tese, resgata-se a obtenção de dados valiosos para o avanço da pesquisa sobre tradução do conhecimento no cenário da atenção primária à saúde. A tese apresenta a notória evolução conceitual da temática no mundo. O Brasil começou a caminhar no entendimento do processo de traduzir o conhecimento científico para a prática.

Constatou-se que o estudo de implementação no contexto da atenção primária deve indicar claramente a prática baseada em evidências a ser implementada, conceituar e justificar o modelo usado para apoiar a escolha da intervenção e informar o delineamento do estudo, bem como as variáveis a serem mensuradas.

Foram evidenciados pequenos efeitos de intervenções únicas, como auditoria e feedback, visita educacional, lembretes e líderes de opinião. Intervenções multifacetadas não foram mais eficazes do que intervenções únicas, mas são frequentemente usadas para promover o uso da pesquisa na prática. Investir em estudos pilotos para adaptar intervenções eficazes, assim rotuladas em outros países, para o cenário brasileiro pode ser uma alternativa. Aumentar a capacitação de pesquisadores brasileiros no delineamento e avaliação de estudos de implementação é relevante para a melhoria deste campo no País.

Esta tese traz uma contribuição metodológica à tradução do conhecimento no contexto da atenção primária à saúde no Brasil, a fim de ser útil para o planejamento de futuros estudos de disseminação e implementação a serem realizados no País.