UPPSALA
UNIVERSITET

Healthcare context for knowledge translation in Vietnam

Development and application of the Context Assessment for Community Health (COACH) tool

DUC DUONG

ACTA
UNIVERSITATIS
UPSALIENSIS
UPPSALA
2017

Dissertation presented at Uppsala University to be publicly examined in Rosénsalen, Entrance 95/96, Akademiska sjukhuset, Uppsala, Wednesday, 22 March 2017 at 09:15 for the degree of Doctor of Philosophy (Faculty of Medicine). The examination will be conducted in English. Faculty examiner: Professor Christopher R Burton (School of Healthcare Sciences, Bangor University).

Abstract

Duong, D. 2017. Healthcare context for knowledge translation in Vietnam. *Development and application of the Context Assessment for Community Health (COACH) tool. Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine* 1297. 67 pp. Uppsala: Acta Universitatis Upsaliensis. ISBN 978-91-554-9811-5.

The failure to translate evidence into clinical practice has been repeatedly highlighted. This failure is partly attributed to disregarding the context within which healthcare is delivered. The aim of this thesis was to develop and psychometrically evaluate the Context Assessment for Community Health (COACH) tool, and, through that process, provide opportunities to measure aspects of context perceived to be important for Knowledge Translation (KT) interventions in low- and middle-income countries (LMIC).

All four studies in this thesis were mainly undertaken in Quang Ninh province, Vietnam during 2008–2014. Study II, however, was also conducted in four other LMICs (Bangladesh, Nicaragua, South Africa, and Uganda). Study I employed inductive content analysis of 16 focus group discussions to explore the influence of context in a community-based facilitation intervention in Vietnam. Studies II and III reported on the development of the COACH tool and assessment of its psychometric properties. Study IV used the COACH tool in a survey among health workers in Vietnam.

To date, three sources of evidence regarding validity of the COACH tool have been provided, that is, test content, response processes, and internal instrument structure, with promising psychometric characteristics. The COACH tool could be used as means of characterizing aspects of context ahead of KT interventions, for tailoring KT strategies, and for further understanding of the results of KT interventions.

Keywords: Knowledge translation, Vietnam, Low- and middle-income country, Healthcare context, Context Assessment for Community Health (COACH) tool, Psychometric properties, Tool development.

Duc Duong, Department of Women's and Children's Health, International Maternal and Child Health (IMCH), Akademiska sjukhuset, Uppsala University, SE-75185 Uppsala, Sweden.

*To those who strive for knowledge translation and
shed light for the followers*

*To my beloved wife, Nguyen Phuong Chi, for your
constant support throughout this doctoral journey*

List of papers

This thesis is based on the four following papers from open access, peer-reviewed journals, which are referred to in the text by their Roman numerals (I–IV).

I. Duong DM, Bergström A, Wallin L, Bui HT, Eriksson L, Eldh AC. *Exploring the influence of context in a community-based facilitation intervention focusing on neonatal health and survival in Vietnam: a qualitative study*. BMC Public Health 2015, 15:814.

II. Bergström A, Skeen S, Duc DM, Blandon EZ, Estabrooks C, Gustavsson P, Hoa DT, Källestål C, Målqvist M, Nga NT, Persson LA, Pervin J, Peterson S, Rahman A, Selling K, Squires JE, Tomlinson M, Waiswa P, Wallin L. *Health system context and implementation of evidence-based practices-development and validation of the Context Assessment for Community Health (COACH) tool for low- and middle-income settings*. Implementation Science 2015, 10:120.

III. Duong DM, Bergström A, Eriksson L, Selling K, Bui HT, Wallin L,. *Response process and test-retest reliability of the Context Assessment for Community Health tool in Vietnam*. Global Health Action 2016, 9.

IV. Duong DM, Eriksson L, Wallin L, Selling K, Bui HT, Bergström A. *Measuring local healthcare context for knowledge translation in primary and secondary levels of care in northern Vietnam: A cross-sectional study*. Manuscript.

Contents

Abbreviations

ACT   Alberta Context Tool

CAI   Context Assessment Index

CFA   Confirmatory Factor Analysis

CHC   Commune Health Center

CHW   Commune Health Worker

COACH   Context Assessment for Community Health

CVI   Content Validity Index

EBP   Evidence-Based Practice

FGD   Focus Group Discussion

ICC   Intraclass Correlation Coefficient

KT   Knowledge Translation

LMIC   Low- and Middle-Income Country

NeoKIP   Neonatal Health – Knowledge Into Practice

ORCA   Organizational Readiness to Change Assessment

PARIHS   Promoting Action on Research Implementation in Health Services

PCA   Principal Component Analysis

Definitions

Context	The environment or setting in which the proposed change is to be implemented
Conceptual framework	Sets of concepts and the propositions that integrate them into meaningful propositions
Evidence	Comprises four types of information: research, clinical experience, patient experience, and information from the local context
Evidence-based practice	Integrates the four following components: the clinical setting and circumstances; the patient's preferences and actions; research evidence; and healthcare resources with all components overlaid by health workers' clinical expertise
Knowledge translation	A dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge
Knowledge translation strategies or Knowledge translation interventions	Strategies or interventions, such as education interventions, patient-directed interventions, aimed to embed evidence into practice and lead to changes in health workers' behavior
Low-income country	Country with a GNI per capita, calculated using the World Bank Atlas method, of $1,045 or less
Middle-income country	Country with a GNI per capita, calculated using the World Bank Atlas method, of more than $1,045 but less than $12,736

Preface

I have been working as a lecturer and researcher in the reproductive health field at the Hanoi University of Public Health, Vietnam since 2006. The work served me well when I started my journey for this thesis in 2009 as an assistant researcher for the Neonatal Health – Knowledge Into Practice (NeoKIP) project in Quang Ninh, a northern province in Vietnam. During this project, my role was to assist in the supervision of the intervention. There was so much to learn and for the entire three years that I had spent working on the project were the most memorable period of my life. It was amazing to me then, that in such a beautiful province as Quang Ninh, one of the most interesting place for tourists in Vietnam to visit, the gap in healthcare provision between richer districts and poorer districts could be so huge! There were newborns and mothers who did not receive essential healthcare services during pregnancy, delivery, and in the first 28 days of the baby's life.

Yes, these variances in the healthcare service provision are not only an issue for Quang Ninh province, but they also exist in many other provinces in Vietnam. The NeoKIP project was successful in promoting an effective strategy for improving neonatal health and survival in several other low- to middle-income countries and indeed proved to also be a success in Vietnam! It was, however, implemented with little understanding of how context might influence its facilitation, therefore, there was a need to further explore which contextual aspects were present and how the practice setting influences the process of gaining and applying the knowledge of health workers in their daily work in Vietnam. Therefore, this doctoral study aimed to contribute to the development and validation of a context assessment tool for low- and middle-income countries and thus enhanced the potential for understanding the influence of contextual factors in the implementation of evidence-based practice in Vietnamese healthcare.

Introduction

Evidence-based practice

Evidence may be one of the most fashionable words in healthcare nowadays. Globally, a huge volume of evidence in healthcare is published annually. As an example, estimates indicate that a health worker who wants to keep up with the advancement of knowledge in their field would need to read up to 20–30 papers daily [1]. Evidence in the delivery of care, in a broad view, comprises four types of information, categorized as research, clinical experiences, patient preferences, and information from the local context [2]. Health workers and patients need access to valid and relevant evidence to make decision without delay and, thus, improve their ability to achieve better patient outcomes. Since the first documented use of the concept in the early 1990s, Evidence-Based Practice (EBP) has become a driving force in the improvement of the quality of care and patient outcomes as well as in the reduction of the cost of care across healthcare settings [3]. Despite being a relatively new term, EBP has rapidly become an international standard for providing effective healthcare [4]. The definition of EBP has been changed many times in its evolutionary process; from a description of clinical decision making to a guide that informs decision. In its early days, EBP was defined as 'the integration of best research evidence with clinical expertise and patient values' to facilitate clinical decision making [5]. The definition of EBP adopted in this thesis integrates the four following components: the clinical setting and circumstances; the patient's preferences and actions; research evidence; and healthcare resources, with all components overlaid by health workers' clinical expertise [6] (Figure 1).

Clinical setting &
circumstances

Patient's
preferences &
actions

Health workers' expertise

Research
evidence

Healthcare
resources
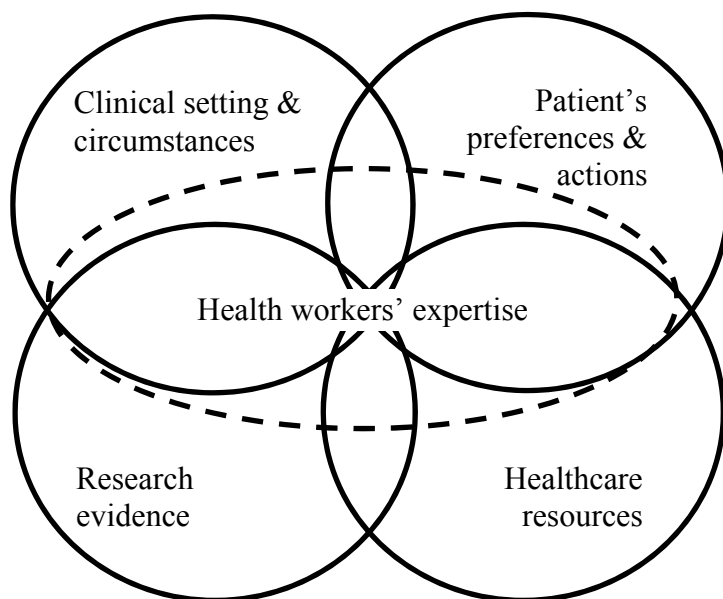
Figure 1. Model for evidence-based practice and clinical decisions [6]

Considering the benefits of basing clinical practice on evidence, EBP has already become the norm for determining both healthcare delivery and the ways in which organizations should operate [7]. Unfortunately, the realization of putting evidence into daily clinical practice remains inconsistent [8, 9]. To date, significant investments have been made to produce and synthesize research evidence for EBP. Considerably less effort has been made to implement evidence into practice. Simply providing synthesized evidence is necessary but not sufficient for ensuring that evidence is being used by practitioners [10, 11]. An example is that guideline-based recommendations are not widely implemented in healthcare settings [8]. Some publications even estimate that it could take 17 years on average to translate 14% of research findings to benefit patient care [12, 13].

There are many reasons why evidence has failed to become applied in optimal use across all decision-maker groups, including health workers and disciplines [8]. Some of these reasons are the limitations of the EBP systems themselves, such as that they include an overwhelming amount of information or contradictory findings in the research. Other barriers are related to a lack of knowledge and negative attitudes concerning EBPs, scarce skills in finding and appraising research findings among health workers, and still others are related to the context, that is, the 'practice setting in which the healthcare is delivered' [14, 15].

The context in which EBP takes place has been considered as a determinant for successful translation of evidence into practice. Among many strategies for overcoming barriers to improve healthcare, building a context in which EBP is valued, supported, and expected would be most helpful, but also difficult to achieve [16].

Knowledge translation

Several terminologies have been used to describe the process of translating evidence into clinical practice [17], which may contribute to confusion about this process and, thus, hinder its advance [10]. In European countries, implementation science and research utilization are commonly used terms [10]. In the US, the terms, dissemination and implementation, research use, and knowledge transfer and uptake, are often used. In Canada, the term Knowledge Translation (KT) has largely been adopted by the Canadian Institutes of Health Research, who state that KT aims to improve healthcare through '*a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge*' [18, para. 1]. This definition implies that KT encompasses the entire process of the creation of new knowledge and its application. The involvement of various stakeholders is what makes KT a broader process than EBP, which focuses on individual health workers [19]. 'Knowledge' in KT has an implicit meaning and is considered to be research-based knowledge, including research findings, and other sources of information, such as local data, patient preferences and clinical experiences that could be used to make decisions within healthcare [20].

The above definition of KT has been accepted and adapted by the World Health Organization [21]. The common element of these different terms is the move beyond simple dissemination of knowledge towards the actual use of knowledge. This thesis applies the definition of KT launched by the Canadian Institutes of Health Research. Further, the thesis also uses 'KT strategies' and 'KT interventions' interchangeably. These two terms both refer to strategies and/or interventions, such as education interventions, patient-directed interventions, whose aim is to embed evidence into practice and thus leads to changes in health workers' behavior [22].

Increasing recognition of the gap between what is known and what is practiced has led to numerous KT interventions to affect health worker behavior, practice or policy change. KT is a complex process and various factors influence the implementation of EBP [23, 24]. Five areas have been revealed as encompassing the most common challenges to influence KT: evidence, health workers, healthcare context, communication and facilitation, and patients [25]. Successful initiatives should target all of these areas, particularly the access to and implementation of valid evidence, evaluation of

healthcare context, and involvement of all relevant groups, such as health workers, policy makers, and patients [26, 27].

Evidence

In terms of evidence, there is much literature discussing the important characteristics of evidence, including its type, quality and volume, which influences the rate, extent, and adherence to its adoption amongst health workers [25, 28]. For example, the content of the evidence, an attribute of its quality, is often inadequate for the needs of the end-users. A paper assessing the description of treatment highlights that 22 out of 25 systematic reviews published over a year (2005–2006) in peer-reviewed scientific journals lack details about types of evidence, its accessibility, and risk of adverse events [29]. These shortages, in turn, do not facilitate clinical decision making and implementation [29].

Health workers

The characteristics of health workers were examined closely in early attempts to understand their influences in relation to EBP [24, 30]. A common challenge that health workers face relates to a lack of knowledge-management skills (the sheer volume of evidence, and skills to appraise, understand, and apply research evidence) combined with infrastructure (their access to evidence) [24]. Lack of skills in appraising evidence is also a challenge because this skill has not been taught in most training programs [23]. Personality traits, such as motivation, learning styles, and learning capacity, also determine the level of adoption of new knowledge [25].

Healthcare context

Recent research also suggests that the failure of KT interventions can be attributed to the disregard of the context within which healthcare is delivered. Healthcare context varies enormously within and between organizations, hampering generalizability of research findings from one to another [31, 32]. KT interventions might be more likely to be successful if organizations are receptive to change and are willing to take risks and to experiment with new evidence [31, 33]. Other context factors that influence EBP implementation include structural determinants, absorptive capacity, and inter-organizational networks [34, 35].

Communication and facilitation

The fourth area, communication and facilitation, includes four approaches that have shown positive outcomes for KT interventions. First, the social network approach has been successful in various professional groups in healthcare [28, 36]. Change champions are another frequently used approach to endorse the adoption of new evidence in organizations [25]. The third approach for promoting change to EBP by influencing the beliefs of the peers is opinion leaders [37]. A fourth promising approach for facilitating evidence is through boundary spanners [28]. A boundary spanner is defined as an individual who 'bridges the structural hole between two clusters conceptualized as being separated by a boundary of some sort, that is outside the network or department' [38].

Patients

The involvement of patients in healthcare delivery is another area that could improve the success of KT interventions [39]. Involving patients in making healthcare decisions could accurately reflect their preferences and values, and thus, may result in better healthcare service provision [40]. Health treatments often have advantages and disadvantages and the health workers alone are not able to determine the best choice of treatment. Yet, little is known about the role of the patient in promoting the rate of adoption of new knowledge among clinicians [39, 40].

Conceptual frameworks for knowledge translation

A number of conceptual frameworks have been developed as a way to better understand the 'black box' of implementation [10, 41, 42]. Frameworks provide useful frames of reference to point their users in the direction of what they need to think about and pay attention to while implementing EBP. In this thesis, conceptual frameworks are viewed as 'sets of concepts and the propositions that integrate them into meaningful propositions' [43, p.27]. KT frameworks can be categorized in the following way: (1) Interaction-focused frameworks; (2) Context-focused models and frameworks; and (3) Individual-focused models [44]. Often there is a lack of consistency about the terms used in conceptual frameworks for KT, and sometimes these terms are not used synonymously across frameworks. As implementation science advances, researchers have attempted to consolidate nomenclature and develop multidisciplinary frameworks [45, 46].

Choosing an appropriate conceptual framework is a potential challenge. Should a single framework or a combination of frameworks be considered? Although a number of criteria have been proposed to facilitate this choice [43, 47, 48], applying these criteria only reduces the list, and does not necessarily identify

the best framework [43]. Amongst many sound theoretical frameworks, the Promoting Action on Research Implementation in Health Services (PARIHS) framework posits the importance of three ingredients for successful change of clinical practice: evidence, context, and facilitation (Figure 2) [41].
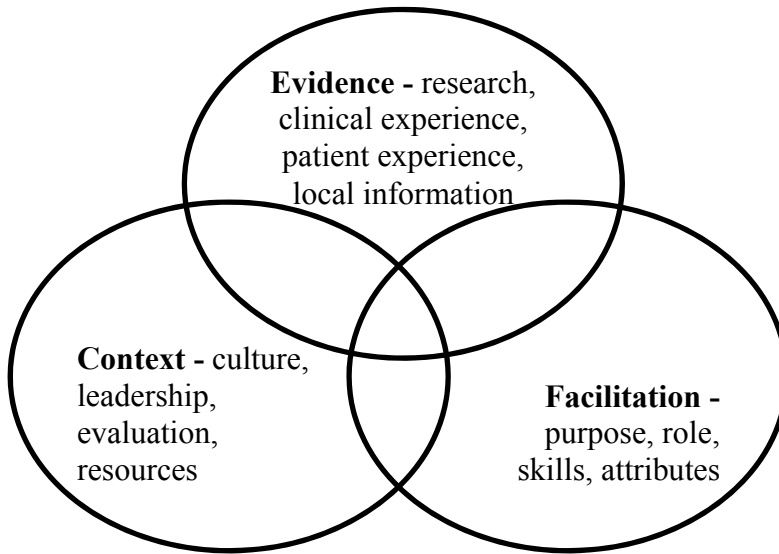
Figure 2. The PARIHS framework: Interrelationship of Evidence, Context, and Facilitation

Developed inductively from the originators' experiences as change agents and researchers, the PARIHS framework, initially published in 1998 [41], has evolved and developed over time [14, 27, 49]. The PARIHS framework was conceived as a means of understanding the complexities involved in the successful implementation of KT. The hypothesis offered by the PARIHS framework is that the ingredients necessary for the successful implementation is a function of the nature and perceptions of the *evidence*, the quality of the *context*, and the way in which the process is *facilitated*, thus, 'Successful implementation = f (E,C,F)'. The three elements, evidence, context, and facilitation, and their sub-elements, are each positioned on a high–low continuum (Figure 2). The working hypotheses were that the most successful implementation will occur when evidence is 'high', health workers agree about it, the context is developed, and where there is appropriate facilitation [50]. The framework could be used under three broad areas of work, namely, as a conceptual framework for research and evaluation, as a basis for tool development, and as a guide for modeling research utilization [43]. The PARIHS framework has a number of strengths. Fundamentally, the framework appears to have a good face validity and is parsimonious with good content validity [44]. The framework provides both broad, and, if required, specific elements and sub-elements that need to be

18

considered for successful implementation. Further, it is flexible enough to be applied in a wide variety of disciplines, clinical settings, and populations, as well as methodological approaches. Because of these strengths, the PARIHS framework has been widely applied, tested, reviewed, and refined in reviews about KT as well as in individual studies and projects amongst its intended users [35, 51-53]. A Google Scholar search using the term 'PARIHS framework', a combination of citations and reports of its actual use or application, yielded approximately 2,230 hits (January 26, 2017).

There are, however, a number of challenges related to the PARIHS framework, including: the lack of evidence from prospective implementation studies on its effectiveness; lack of clarity between elements and sub-elements of the framework; a focus on the role rather than the process of facilitation; and the lack of a clear definition of what 'successful implementation' actually is [54]. Other weaknesses of the model are that it fails to focus on the central role of individual health workers [55] and the shortage of evidence on the social, political, and legal context of implementation [56]. This has led to the creation of the refined version of PARIHS, the integrated PARIHS (i-PARIHS) framework, in the last few years [27]. This thesis, however, applied the PARIHS framework as its design was conceived before the revised version of the framework was developed.

Healthcare context for knowledge translation

For evidence to be successfully implemented into practice, the importance of context as a key influence on KT has been widely recognized [31, 35, 57]. There is, however, little information about this influence, for example, what makes a context receptive to evidence and what contextual factors have the most impact on KT. Thus, there is a clear need for research in this field to clarify how context relates to the use of evidence and to develop methods for assessing and appraising the potential impact of contextual factors on KT interventions.

Context is a multifaceted concept, which can be seen as infinite as it exists in a variety of settings, communities, and cultures that are all influenced by a variety of factors. Context can include leadership, policy, organizational structure, and societal and cultural issues [31, 55]. As a result, there are few contexts, if any, that are the same, even within the same area of practice. The complexity of context has been referred to by many KT researchers as the 'black-box of practice' [48]. Because of the diverse elements of context, multiple methods to implement EBP are needed.

Due to its complexity, there is still no consensus with regard to defining context [31]. It is almost impossible to capture all of the different contextual factors related to healthcare practice. In the PARIHS framework,

context is defined as 'the environment or setting in which the proposed change is to be implemented' [31, p. 150]. The practice settings, which shape how health workers experience the organization, and ultimately how evidence is translated into practice, are important. According to the PARIHS framework, context is primarily comprised of three sub-elements: culture, leadership, and evaluation [31, 50], spanning a continuum from 'high' to 'low' that indicates a more or less favorable context for a successful implementation to occur.

Culture is defined as 'forces at work, which give the physical environment a character and feel' [41, p. 152]. Subsequent exploration resulted in the further refinement of the term *Culture* to include the existing beliefs and values, as well as the receptivity to change, among health workers in a facility [31]. Culture influences the way things are carried out, understood, judged, and valued [58]. Ideal culture is defined as 'transformational' because it is always changing, adapting, and responding to the work context [59]. A transformational culture is based on values that enable staff at all levels to feel empowered, to develop their own potential, and to be innovative in developing practice and thus produce best practice for patients [59].

The PARIHS framework defines *leadership* as the 'nature of human relationships' [31, p.98] with effective leadership giving rise to clear roles, effective teamwork and organizational structures, and involvement by organizational members in decision making and learning. 'Transformational leaders' is a broad term reflecting effective leaders, who are committed to allowing themselves and others to optimize their skills, abilities, knowledge, and potential [59]. They are described as leaders who could gather different types of evidences together (research, patient experience, and clinical experience) and implement these evidences into practice. In this way they can change the work culture and create a supportive context for EBP [31]. The PARIHS framework points out that everyone can be a leader of something, and that the potential for leadership needs to be developed and released [49].

Evaluation is described as feedback mechanisms (individual and system level), sources, and methods of evaluation [14, 41]. Evaluating practice takes many forms, from the use of 'hard' data (such as cost-effectiveness and length of stay) to 'soft' data (such as the patients' experience of practice). In an effective culture, healthcare professionals use evidence gathered from various sources to make decisions about individual or organizational effectiveness. This culture embraces peer review, user-led feedback, and reflection on practice, as well as evidence from systematic literature reviews, meta-analyses, and audits of effectiveness. Audit with feedback, one of the most commonly applied evaluation methods in healthcare facilities, provided to staff within units has potential to result in improved professional practice [60]. Research implementation is

hypothesized by the PARIHS developers to be most successful when evaluation occurs routinely.

Resources, are suggested as the fourth sub-element of context [49]. Time, equipment, and clinical skills as resources are needed to implement research findings [49]. Effective and sustainable KT may require the development of organizational knowledge infrastructures to facilitate access, dissemination, exchange, and/or use of evidence [61]. Components of organizational knowledge infrastructures are classified into two broad categories: technological and organizational [62]. Technological components include electronic databases and search engines. Organizational components include documentation specialists, data analysts, knowledge brokers (that is, 'individuals who manage the collaboration between an organization, external information, and knowledge producers and users' [61, p. 4]), and training programs (to facilitate activities such as searching for evidence, and using evidence).

Measurement tools to assess healthcare context

Another way that PARIHS has been used is as the basis for the development of measurement tools. The elements and sub-elements have been used to develop diagnostic and evaluative questions, which could guide users in developing particular interventions or provide insights on how context influenced the implementation and outcomes of particular interventions. Success is deemed to be more likely within the organization or setting with a strong context where the dominant values and beliefs are defined, individual staff and patients are valued, the organization is classified as 'learning', and consistent teamwork and leadership exist [31]. Despite the advancements of the PARIHS framework, relatively few studies have quantified elements of context (culture, leadership, and evaluation) or investigated how external factors – operating at micro, meso or macro levels – determine context [27, 47, 63]. Thus, developing instruments for systematic assessment of the healthcare context have been considered to be of importance. Such instruments would not only benefit a deepened understanding of practice context and its association with the implementation of EBP but would also provide information to tailor KT interventions adapted to the specific context [64].

This thesis departed from the notion that the three available tools for measuring context were developed for high-income settings and that none of them were adapted for or available for use in Low- and Middle-Income Country (LMICs). The three instruments, all developed based on the PARIHS framework, were the Organizational Readiness to Change Assessment (ORCA) [57], the Context Assessment Index (CAI) [34], and the Alberta Context Tool (ACT) [65]. The ACT was initially developed

in Canada to measure healthcare professionals' perceptions of their work context [66]. The ACT comprises 56 items representing eight contextual dimensions: (1) leadership, (2) culture, (3) evaluation, (4) social capital, (5) structural and electronic resources, (6) formal interactions, (7) informal interactions, and (8) organizational slack (staffing, space, and time) [65]. It has been applied in several studies in high-income countries amongst different professional groups, such as physicians, nurses and nurse assistants [66], and medical specialties, including residential long-term care [67], elderly care [68], and pediatric acute care [35].

The CAI has been developed to assist health workers with assessing and understanding the context in which they work and the effect it has on implementing evidence into practice [34]. The third tool, ORCA, measures readiness to change at the organizational level and focuses the respondent on a specific change referent rather than on innovation in general [57]. The ORCA is designed to be used after an organization has agreed to adopt a change but prior to the start of implementation efforts. It assesses aspects of both the willingness of respondents to adopt the new practice (that is, agreement with the evidence and innovative culture) and their capability to implement change (that is, available resources and leadership effectiveness).

Out of the three tools, the ACT is the instrument that has been most widely used and has been subjected to the most rigorous evaluation of validity and reliability, such as thorough surveys in pediatric clinics [69] and in residential long-term care centers [52].

There has been no tool readily available for use in LMICs, where contextual issues influencing efforts to implement EBPs might include other aspects than those in high-income settings [70, 71].

Knowledge translation in low- and middle-income countries

The final report on the Millennium Development Goals suggests that while there have been remarkable achievements in health and well-being, progress has been uneven across regions and countries [72]. For example, a vast majority of LMICs failed to meet targets of reducing the child mortality by two-thirds and the maternal mortality ratio by three-fourths between 1990 and 2015 [72]. To complete what the Millennium Development Goals did not fully achieve, the commitment to KT represents a major opportunity for enhancing healthcare, particularly for populations in resource-scarce settings [73]. A sound example is that up to three-fourths of the neonatal deaths in LMICs could be averted using available cost-effective interventions [74].

Unfortunately, the KT process is generally slow, particularly in LMICs [15, 75], and continues to be fraught with challenges, and, at times, is unsuccessful in

these settings [71, 75]. LMICs cannot afford to waste money and resources on treatments that are not effective due to the scarcity of resources [76, 77]. There is little empirical knowledge on effective KT strategies to translate EBP into clinical practice in the case of LMICs [15, 78]. Further efforts must be made to understand the best KT strategies to effectively introduce new knowledge into practice in these settings. In doing so, the need to select a strategy suited to the type of evidence, the individuals involved, and the local context, is highlighted [61].

There is some evidence of the effectiveness of KT interventions to improve health outcomes in LMICs. Using facilitation and a participatory process with women's groups in communities has been shown to be effective in reducing neonatal mortality in LMICs [79]. Further, audit and feedback has been found to be an effective method for changing health workers' behavior [78]. However, the evaluations of these KT interventions indicate that the effect size of these interventions is highly variable and dependent on the setting, raising questions of whether they would be effective across different settings [79]. Although contextual aspects could help explain this variation, only a few studies have been conducted to measure contextual factors in relation to KT in LMICs, thus there is scarce empirical knowledge on how to translate evidence into practice [78, 80, 81].

Healthcare context in Vietnam

Along with economic reforms, since the late 1980s, Vietnam's healthcare system has been transformed from a fully public services system to a mixed public-private provider system. Vietnam's healthcare system comprises four administrative levels (Figure 3): national level (Ministry of Health), provincial level (provincial health departments), district level (district health offices), and commune level (commune health center). The service delivery is divided by four official levels of organization: (1) national level (central and regional hospitals); (2) provincial-level providers (provincial and regional hospitals); (3) district-level hospitals and centers; and (4) commune health centers [82].
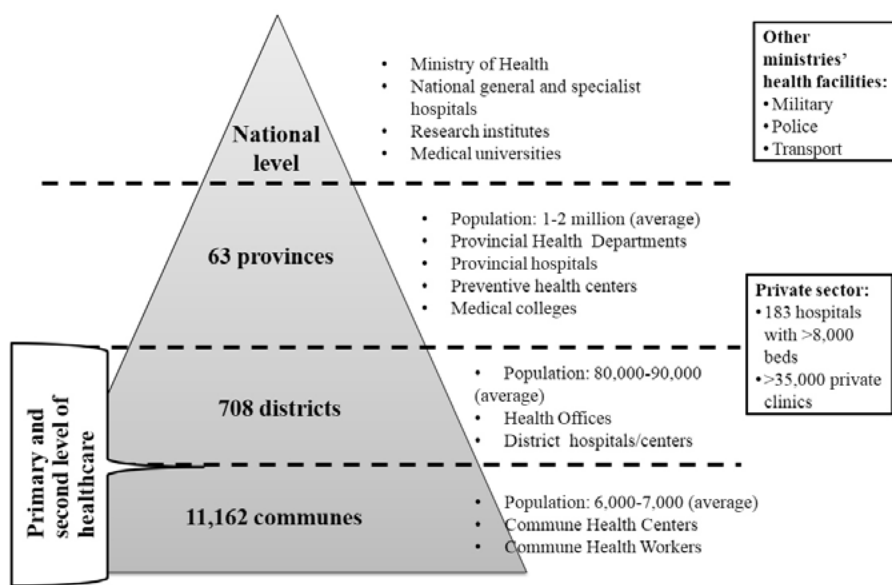
Figure 3. The health system hierarchy in Vietnam in 2015 [83]

At the national level, the Ministry of Health formulates and supports the implementation of national health policies and programs. Provincial, district, and commune health facilities are responsible for healthcare services at their corresponding levels: tertiary care is provided at provincial hospitals, secondary care at district hospitals, and primary care at commune level. Emergency and comprehensive obstetric service and inpatient care are provided at district hospitals (secondary care level), for an average of 80,000–90,000 people in the surrounding community [82]. Commune Health Centers (CHCs) provide primary health services, such as normal birth assistance, basic obstetric care, and outpatient care, for an average of 6,000–7,000 people in its catchment areas. Each CHC employs five to six health workers, including physicians, nurses, midwives, and pharmacists. In addition, each CHC is supported by an extensive network of 8–10 Community Health Workers (CHWs), also referred to as 'village health workers', who conduct outreach activities in each of the villages belonging to the commune where the CHC is located. CHWs assist in providing preventive services and collecting routine health data at the village level [82].

The health sector has achieved remarkable progress in improving its capacities and performance since its economic reformation in 1986 [84]. Vietnam's health indicators are better than what currently occur in other LMICs at its development level [85]. During the last 30 years, Vietnam's health system has witnessed multiple reforms [82], such as the introduction of user charges, the legalization of the private health sector and the initiation of

health insurance schemes, decentralization and government stewardship, and the provision of funding for healthcare for the poor and children under six years of age. The private sector has grown steadily, but is mainly active in outpatient care. However, private clinics are generally small in size and are located in urban areas. Little is known about the performance and quality of services provided in the private healthcare sectors, especially as many of these health workers are not licensed.

The government has emphasized the development of an effective and safe healthcare system to achieve universal health coverage. Primary healthcare, which is provided in primary and secondary levels of care, is among the most important strategies to pursue 'social justice, the right to better health for all, participation and solidarity' [86, p.1]. The service delivery, however, faces many challenges. The most crucial issues are: the shortage of human resources with high-level qualifications for healthcare, especially in primary and secondary levels of care; the lack of an effective health management information system; the high proportion of out-of-pocket payments; and the weakness in quality of the management of health services [87].

Rationale

The call for research to better understand contextual factors influencing KT interventions in LMICs has been emphasized repeatedly [78, 88, 89]. The assessment of the healthcare context is a critical issue, yet there is a lack of instruments specifically developed for LMICs that could capture reliable and valid information on relevant aspects of the healthcare context and could be used amongst various health professional groups. Thus, based on the context element of the PARIHS framework, this doctoral study aimed to develop and psychometrically validate a tool for LMICs to assess aspects of context influencing the implementation of EBPs. Such a tool could help to achieve better insights into the process of implementing EBP by: (1) enhancing the opportunities to act on locally identified shortcomings of the health system to increase effectiveness; (2) guiding planning and promoting adaptation of implementation strategies to the local context; and (3) linking contextual characteristics to outcome indicators of healthcare interventions.

Aims

General aim

The overall aim of this doctoral study was to contribute to the development and validation of a context assessment tool for LMICs and thus enhance the potential for understanding the influence of contextual factors in the implementation of EBP in Vietnamese healthcare.

Specific objectives

1. To explore the influence of context on the facilitation process in a community-based intervention in Vietnam.
2. To develop and initially validate the Context Assessment for Community Health (COACH) tool for measuring aspects of context influencing the implementation of EBPs in LMICs.
3. To advance the validity and reliability properties of the COACH tool by exploring the understanding, testing the stability, and evaluating its internal structure among health workers in Vietnam.
4. To describe aspects of context influencing the implementation of EBPs among health workers at primary and secondary levels of care in Vietnam.

Methods

Study setting

All four studies in this thesis were mainly undertaken in Quang Ninh province, Vietnam (Figure 4). Study II, however, was conducted in five countries (Bangladesh, Nicaragua, South Africa, Uganda, and Vietnam), where Quang Ninh province constituted the study setting in Vietnam. Quang Ninh can be considered representative of Vietnam in terms of geography, demography, and administrative construction. The province is located in north-eastern Vietnam, 120 km east of the capital Hanoi. Quang Ninh is a large province with a long coastline and bordering China to the north. The terrain of the province varies, and 80% is covered by mountains and hills. Quang Ninh is a developing province, with its annual average income per capita recently reaching US $2,000 [90]. The province is divided into 14 districts and has more than one million inhabitants, with 8% of the population belonging to what is defined as 'poor' households (having an average income of less than US $240–$250 per capita per year) [90]. The province has a diverse ethnic pattern with 10 ethnic groups, whereof Kinh is the majority (accounting for about 90% of the population) [90]. Most of the ethnic minority groups have their own language and culture, which differs from each other and from Kinh.

The healthcare system in Quang Ninh province follows the national guidelines, which consists of tertiary care provided at provincial hospitals, secondary care at district hospitals, and primary healthcare at commune level [91]. The primary and secondary healthcare is provided through 13 district hospitals and 184 CHCs. Besides the formal healthcare system, other local stakeholder groups, such as the Women's Union, also serve the population regarding healthcare issues.
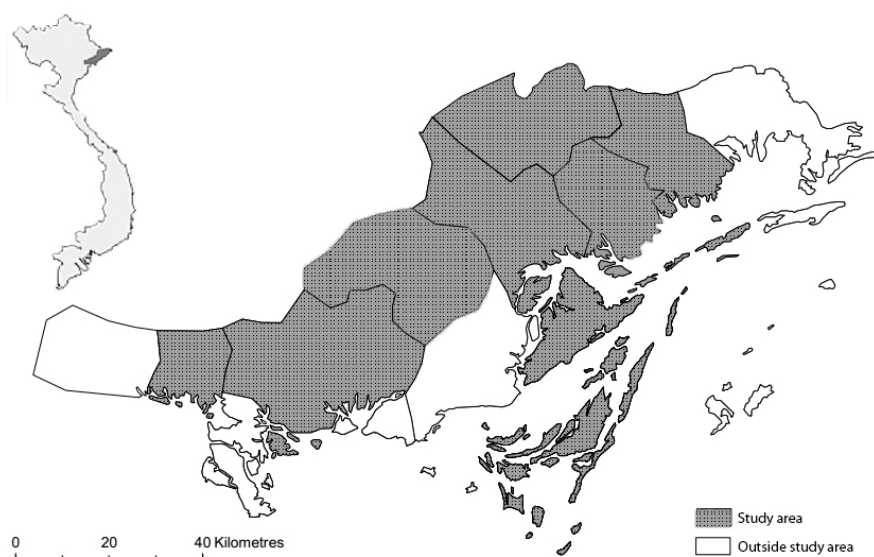
Figure 4. Maps of Quang Ninh province, Vietnam, the study setting for the thesis

The Context Assessment for Community Health project

NeoKIP (Neonatal Health – Knowledge Into Practice, ISRCTN44599712), a population-based cluster randomized study, was conducted in Vietnam over three years (2008–2011) to evaluate the effectiveness of facilitation as a KT strategy for improved neonatal health [92]. The NeoKIP trial resulted in a 49% lower risk of neonatal mortality in the intervention areas versus the control areas [93]. This achievement asserted the strategy of using facilitators to support local stakeholder groups for improving neonatal health and survival in an LMIC [92].

The NeoKIP intervention was informed by the PARIHS framework [92]. In the framework, *context* is acknowledged as an important aspect to consider in achieving a successful implementation [70]. Similar to the NeoKIP project conducted in Vietnam, other interventions aimed at improving KT for maternal and neonatal health were undertaken in several other LMICs and discussed at annual meetings within an international research network. In these meetings, the context in which these interventions were implemented was repeatedly reported as being an important factor, but there was, to our knowledge, no systematic way to assess its aspects or influence. Thus, the idea of developing a tool for measuring the aspects of context that influence the implementation of KT interventions in LMICs was conceived.

The Context Assessment for Community Health (COACH) project was thus developed within an international network of researchers with the aim of

28

developing and testing a tool to assess aspects of healthcare context that influence the implementation of EBP in LMICs. The network formed a core group to carry out the COACH project and included researchers from Bangladesh, Canada, Nicaragua, South Africa, Sweden, Uganda, and Vietnam. The researchers had extensive experience in working on projects conducted in LMICs. For three years (2010–2013), the COACH project was undertaken in five countries, including Bangladesh, Nicaragua, South Africa, Uganda, and Vietnam.

Study design, sample, and data collection

The Standards for Educational and Psychological Testing guided the six phases of development (Studies I and II). The COACH tool was further tested in a psychometric assessment (Studies III and IV), and this measured aspects of the healthcare context that were considered to be of importance for KT in healthcare in LMICs (Study IV) [94]. A mixed-methods approach, applying both quantitative and qualitative methods, was used in this thesis (Table 1).

For Study I, we applied a secondary qualitative content analysis for 16 Focus Group Discussions (FGD) with facilitators and a sample of the stakeholder groups from the NeoKIP trial (2008–2011). This study was undertaken to explore the influence of context on the facilitation process in the NeoKIP intervention. Semi-structured interview guides, with open-ended questions and probes [95], steered all FGDs. These FGDs targeted all facilitators at four different occasions (at 0, 6, 27, and 36 months) and FGDs conducted with six of the stakeholder groups in the NeoKIP intervention at 2 different occasions (21 and 36 months into the intervention). The six stakeholder groups participating in the FGDs were purposely sampled and represented a variety of groups in relation to their geographical locations, facilitator performance in the groups, and overall group performance in terms of neonatal and maternal healthcare. Each FGD lasted 60–120 minutes. All FGDs were audio recorded, transcribed verbatim, and translated into English.

Table 1. Overview of the four PhD studies

	Study I	**Study II**	**Study III**	**Study IV**
Research question	How do aspects of context influence a KT intervention in a LMIC?	• What are the dimensions of context influencing KT in LMICs? • Is it possible to develop a generic tool aimed to measure aspects of context for KT in LMICs?	• How do respondents understand the COACH tool and what determines their response process? • What is the stability of the COACH tool?	• How do health workers in Vietnam perceive aspects of context influencing the implementation of EBPs? • What is the internal consistency of the COACH tool?
Design, study sample, and data collection	Secondary data analysis (16 focus group discussions (FGD) with facilitators and intervention groups)	• Content validity assessment with 41 experts • Response process evaluation with 11 health workers • Internal structure evaluation including 690 health workers	• Response process evaluation with 16 health workers by think-aloud interviews • Test-retest reliability on 77 health workers	Cross-sectional survey on 677 health workers
Setting	Quang Ninh province, Vietnam	Bangladesh, Nicaragua, South Africa, Uganda, and Vietnam (Quang Ninh province)	Quang Ninh province, Vietnam	Quang Ninh province, Vietnam
Data analysis	Inductive qualitative content analysis	• Content Validity Index (CVI) • Response problem matrix • Reliability (Cronbach's alpha coefficient) • Principal Component Analysis (PCA)	• Response problem matrix • Intra-class Correlation Coefficient (ICC) & Bland-Altman plots	• Descriptive and correlational statistics (stepwise backward elimination for binary logistic regression) • Confirmatory Factor Analysis (CFA)
Study period	**2008 – 2011**	**2010 – 2013**	**2014**	**2014**

In Study II, we aimed to develop and psychometrically validate the COACH tool in its ability to assess the aspects of the healthcare context that influence the KT in LMICs. The development of the COACH tool departed from the PARIHS framework and went through six phases [94]: (I) Defining dimensions and developing a draft version of the COACH tool; (II, III) Content validity assessment in country panels and amongst international experts; (IV) Response process; (V) Translation; and (VI) Investigating the internal structure (Figure 5). The approach adopted for assessing reliability and validity was guided by the Standards for Educational and Psychological Testing [94].
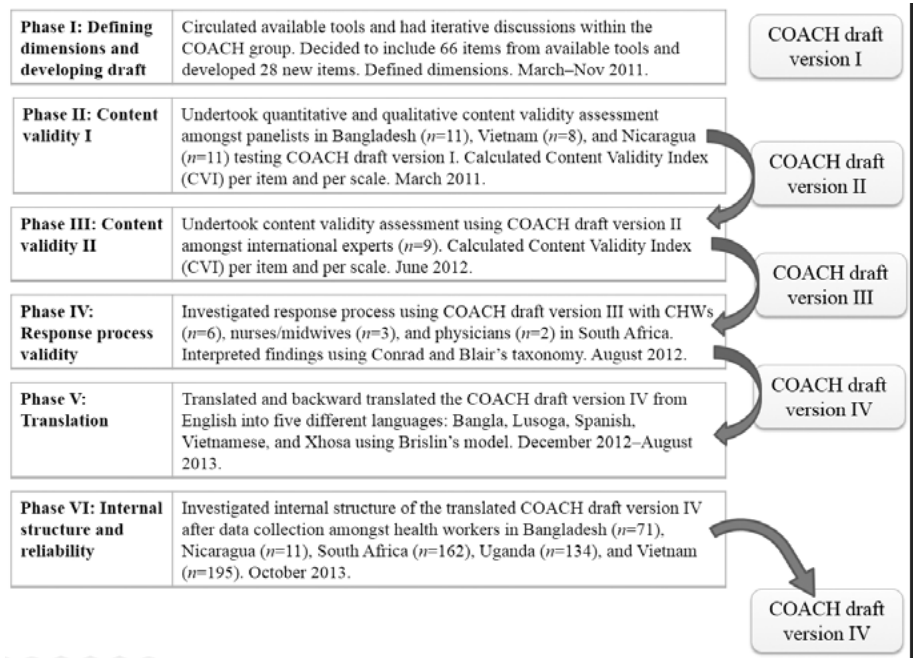

Phase I: Defining dimensions and developing draft	Circulated available tools and had iterative discussions within the COACH group. Decided to include 66 items from available tools and developed 28 new items. Defined dimensions. March–Nov 2011.	COACH draft version I
Phase II: Content validity I	Undertook quantitative and qualitative content validity assessment amongst panelists in Bangladesh (n=11), Vietnam (n=8), and Nicaragua (n=11) testing COACH draft version I. Calculated Content Validity Index (CVI) per item and per scale. March 2011.	COACH draft version II
Phase III: Content validity II	Undertook content validity assessment using COACH draft version II amongst international experts (n=9). Calculated Content Validity Index (CVI) per item and per scale. June 2012.	COACH draft version III
Phase IV: Response process validity	Investigated response process using COACH draft version III with CHWs (n=6), nurses/midwives (n=3), and physicians (n=2) in South Africa. Interpreted findings using Conrad and Blair's taxonomy. August 2012.	COACH draft version IV
Phase V: Translation	Translated and backward translated the COACH draft version IV from English into five different languages: Bangla, Lusoga, Spanish, Vietnamese, and Xhosa using Brislin's model. December 2012–August 2013.	
Phase VI: Internal structure and reliability	Investigated internal structure of the translated COACH draft version IV after data collection amongst health workers in Bangladesh (n=71), Nicaragua (n=11), South Africa (n=162), Uganda (n=134), and Vietnam (n=195). October 2013.	COACH draft version IV

Figure 5. COACH tool development phases and methods used

In Study III, the Vietnamese version of the COACH tool was further explored by undertaking a response process and a test-retest survey to assess the stability of the constructs. First, 16 think-aloud interviews were undertaken in 2014 with five CHWs, six nurses/midwives and five physicians to investigate the response process. Following the think-aloud interviews, the test-retest survey, using the COACH tool as a self-administered questionnaire, was investigated by including 77 health workers from all 10 CHCs in one district and from the maternal and neonatal departments at the district hospital in the same district in the Quang Ninh province. The time interval between the test and retest survey was 6–13 weeks depending on the type of health facility.

Study IV used the COACH tool to describe the healthcare context as perceived by health workers at primary and secondary levels of care in Quang Ninh province in Vietnam. During August–September 2014, a cross-sectional survey was administered to 677 eligible health workers in 90 CHCs (primary level) and maternal and neonatal departments at seven district hospitals (secondary level) in the areas where the NeoKIP trial had been conducted [92]. Eligible respondents were full-time health workers (physicians, nurses, and midwives) who had been working for at least one year at their current unit. Further, half of the CHWs who had worked in their current position for at least three years were also randomly selected.

Data analysis

In Study I, transcripts of FGDs were analyzed by applying inductive content analysis [96] in five steps: (1) initial reading and re-reading of FGD transcripts to get a naïve understanding of the context; (2) identifying and labelling all meaning units using a structured analysis; (3) create sub-categories from the meaning units; (4) create categories from these sub-categories; (5) and create main-categories from the categories. The naïve understandings were used as a background to assure trustworthiness of the analysis [46]. The analysis was undertaken separately by four authors, and was discussed together until full agreement was reached.

In Study II, a variety of analysis methods were performed through the six steps of the tool's development. This study consisted of three evidentiary perspectives of validation: (a) content validity; (b) response processes; and (c) internal structure. Phases II and III used content validity index (scale-content validity (S-CVI) and item content validity (I-CVI) [97]) in identified panels of 8–11 experts to assess the perceived relevance of each item in the COACH tool. The 41 panel experts in Bangladesh ($n = 11$), Nicaragua ($n = 11$), Uganda ($n = 11$), and Vietnam ($n = 8$) assessed the English version of the COACH version I tool. A response process investigation was applied in Phase IV to understand how respondents (CHWs ($n = 6$), nurses/midwives ($n = 2$), and physicians ($n = 2$)) comprehended the items and the cognitive processes that contributed to the resulting response decision. The think-aloud interviews were analyzed using Conrad and Blair's taxonomy [98] addressing the following: lexical problems, inclusion/exclusion problems, temporal problems, logical problems, and computational problems. Phase V applied the translation process followed by Brislin's model [99, 100], including several rounds of *forward translation*, *backward translation*, *review*, and *comparison* of the original and the translated version focusing on conceptual equivalence. Finally, Phase VI analyzed the internal consistency of the COACH tool using Cronbach's alpha and

Principal Component Analysis (PCA) with varimax rotation extraction. The data included an equal number of respondents across the three health worker groups (CHWs, nurse/midwives, and physicians) and the five countries. Factors with eigenvalues greater than 1 were extracted. A factor loading greater than 0.40 was regarded as 'practically' significant [101]. The final COACH version V tool included 49 items in eight dimensions: *Resources, Community engagement, Monitoring services for action, Sources of knowledge, Commitment to work, Work culture, Leadership,* and *Informal payment.* Items in all dimensions of the COACH tool except the *Sources of knowledge* dimension were rated using a five-point Likert scale ranging from '*strongly disagree*' to '*strongly agree*'. These seven dimensions were referred to as *scaled.* The *Sources of knowledge* dimension includes five items which used the following response options: *not available* and a five-point frequency scale for *available*, signifying that the sources asked for are *available* and are used to varying degrees (that is, *never, rarely, occasionally, frequently,* and *almost always*). This dimension was referred to as *non-scaled*.

Study III applied Conrad and Blair's taxonomy [98] to analyze identified problems emerging from 16 think-aloud interviews. Further, the identified problems were also grouped into two categories according to our estimation of the magnitude of the problem's effect on response data: prominent versus minor problems [102]. To determine the stability of the COACH tool, each item's level of reliability was analyzed using Intraclass Correlation Coefficient (ICC) and percent agreement, whereas the analysis of the dimension level applied ICC and Bland-Altman plots.

Study IV described the healthcare context for KT as perceived by health workers through their responses to the COACH tool's items and dimensions. Scores of the seven *scaled* dimensions, which include items rated using a five-point Likert scale, were calculated using their individual mean scores (mean score method). Notably, scores of the six negatively worded items (items 42–47) in Informal payment dimension were reversed in the analyses. For the *non-scaled* dimension, *Sources of knowledge*, the items' scores were recoded into 0 (*not available, never,* and *rarely*), 0.5 (*occasionally*), and 1 (*frequently* and *always*). The overall score of this dimension was then calculated by adding the items' recoded scores. The scores of scaled dimensions were categorized into 'high' and 'low' with a cut-off set at >3.5 (high) and ≤3.5 (low) to represent a context theoretically more or less supportive of change. The relationships between the healthcare context and demographic characteristics of the health workers were calculated by binary logistic regression. In addition, we further examined the internal structure of the COACH tool by applying a first-order independent cluster model of Confirmatory Factor Analysis (CFA). The CFA explored the loading of items to the latent structure of the COACH tool, that is, to the sub-dimensions and dimensions. The model fit was presented using multiple

conventional fit indices, including comparative fit index, the Tucker-Lewis Index, the standardized root mean residual, and the root mean square error of approximation.

Ethical considerations

Ethics approval for Study I was obtained from the Ministry of Health in Vietnam (ref 3934/QD-BYT), the Provincial Health Bureau in Quang Ninh and the Research Ethics Committee at Uppsala University in Sweden (ref 2005:319). Study II was approved by the Ethical Review Committees in Bangladesh, Nicaragua, South Africa, Sweden, Uganda, and Vietnam. Studies III and IV were approved by the Provincial Department of Science and Technology in Quang Ninh province, Vietnam (ref 3934/QD-BYT) and the Research Ethics Committee at Uppsala University, Sweden (ref 2014:205).

Participation in all four studies was voluntary. Respondents were informed that their responses were anonymous, confidential, and kept secure. They were also informed about the purpose of each study and thereafter gave their verbal/written consent to participate. In Studies III and IV, the data collector encouraged respondents not to discuss their responses with each other while providing their answers to the COACH tool. Data were handled confidentially and de-identified.

Results

The COACH tool was developed and initially validated amongst three health worker groups (CHWs, nurses/midwives, and physicians) across five LMICs (Studies I and II). The tool was then further tested psychometrically (Studies III and IV), and finally applied to describe aspects of the healthcare context and their perceived importance for KT amongst health workers at primary and secondary levels of care (Study IV) in Vietnam.

Development of the COACH tool

Throughout the six phases of its development, the COACH tool was a collaborative work between researchers in Canada, Bangladesh, Nicaragua, South Africa, Sweden, Uganda, and Vietnam and the tool was tested amongst three professional groups (CHW, nurse/midwife, and physician) on a pooled dataset from all countries. The final COACH tool (version V) covers eight dimensions of context perceived to be of importance for the implementation of EBPs: *Resources, Community engagement, Monitoring services for action, Sources of knowledge, Commitment to work, Work culture, Leadership,* and *Informal payment* (Table 2). As the result of the development process, the number of items were reduced from 94 to 49, which included 44 five-point Likert items (*scaled* items) and five six-point frequency items (*non-scaled* items). The *non-scaled* items asked the respondents about how often they use particular sources of knowledge in a 'normal' month. In general, the COACH tool was shown to have evidence of acceptable reliability and internal structure.

Table 2. Definition of COACH tool dimensions

Dimension	Definition
Organizational resources	The availability of resources that allow an organization (unit) to adapt successfully to internal and external pressures.
Community engagement	The mutual communication, deliberation and activities that occur between community members and an organization (unit).
Monitoring services for action	The process of using locally derived data to assess performance and plan how to improve outcomes in an organization (unit).
Sources of knowledge	The availability and use of sources of knowledge in an organization (unit) to facilitate best practice.
Commitment to work	The individual's identification with and involvement in a particular organization (unit).
Work culture	The way 'we do things' in an organization (unit) reflecting a supportive work culture.
Leadership	The actions of a formal leader in an organization (unit) to influence change and excellence in practice achieved through clarity and engagement.
Informal payment	Payments or benefits given to individual(s) in an organization (unit), which are made outside the officially accepted arrangements, to acquire an advantage or service.

Defining dimensions and developing items (Phase I)

The COACH version I tool was a result of a thorough process of developing dimensions and items through literature studies and iterative discussions. The dimensions and items of ACT were used as the starting point for the process of identifying dimensions and items to be included in the COACH tool. All dimensions in the ACT were included as they were considered to be relevant for testing in LMICs.

Further, studies focusing on how aspects of the healthcare context influence KT interventions in LMICs were reviewed. In the NeoKIP trial in Vietnam, three main-categories of context influencing the facilitation process were reported: (1) Support and collaboration of local authorities and other communal stakeholders; (2) Incentives to, and motivation of, participants; and (3) Low healthcare coverage and utilization. Notably, local authorities' engagement, non-financial incentives, and organizational resources in resource-scare settings were recognized as being important and were considered to be included in the COACH tool.

Testing content validity across expert panels (Phases II and III)

Content validity assessment was exercised with the English version of the COACH versions I and II tool. In Phase II of the tool's development, the content validity assessment showed that several dimensions reached scale-content validity index/average of 0.9 in one or more of the settings. However, none of the dimensions reached the generally accepted thresholds, that is, the scale-content validity index/average (S-CVI/Ave) $\geq$ 0.9 or scale-content validity index/universal agreement (S-CVI/UA) $\geq$ 0.8 in all of the four settings [63]. The result from the content validity assessment was used to improve the tool. A COACH version II tool was developed based on findings from Phase II. Content validity was also assessed amongst eight international experts in Phase III, which resulted in the development of COACH version III tool.

Exploring understanding of the COACH tool (Phase IV)

The response process was evaluated using the COACH version III tool via 11 think-aloud interviews amongst health workers in South Africa. The results revealed that most items were easily understood. However, ten of the items were found to be difficult to understand. These findings were used when revising the tool, which resulted in the COACH version IV tool.

Translation of the COACH tool (Phase V)

The COACH version IV tool was translated from English into Bangla (Bangladesh), isiXhosa (South Africa), Lusoga (Uganda), Spanish (Nicaragua), and Vietnamese (Vietnam) following the Brislin's model [100]. The process included several rounds of forward–backward translation with rigorous comparisons between the original and the five translated versions of the COACH tool. The dimension that was considered to be most challenging to translate was *Informal payment*. After the translation process was complete, the English COACH version IV tool and the five translated versions were considered ready for reliability and PCA testing.

Exploring internal structure and reliability (Phase VI)

The reliability of the COACH version IV tool was examined using Cronbach's alpha coefficient, corrected total item correlation and inter-item correlation, and test-retest for its stability. All the COACH tool dimensions but one reached acceptable Cronbach's alpha levels of ≥ 0.70 (ranging between 0.76 and 0.89). The *Sources of knowledge* dimension had a Cronbach's alpha of 0.69. All items in the dimensions had a corrected total item correlation of >0.3, and

all dimensions had an average inter-item correlation of >0.3, which was judged to be good [103].

The internal structure of the COACH version IV tool was primarily investigated using PCA. The PCA revealed that an 11-factor structure accounted for 63.6% of the variance in the dataset merged from all five settings. The COACH tool had a good fit between the theoretical constructs and results from the factor analysis.

Further psychometric assessment of the COACH tool in Vietnam

Studies III and IV further tested the validity argument based on exploring the understanding, testing the stability, and evaluating internal structure of the COACH tool.

Exploring the understanding of the COACH tool

The final COACH version V tool in English was translated forward and backward to Vietnamese via several rounds ahead of testing its content validity and test-retest stability. The response process was evaluated using the Vietnamese version of the final COACH version V tool (Study III). The investigation relating to the response process in Vietnam provided evidence that the COACH tool was clear, well organized, and easy to answer. Most of the items were understood as intended or had only minor problems. However, problems were identified in 19 of the 49 items, whereas five items contained prominent problems and 14 items had minor problems. A few items had more than one problem, thus, in total we identified 23 problems (10 lexical, five logical, seven inclusion/exclusion, and one computational problem) (Table 3). Further, we identified that some of the contents in the *Commitment, Leadership* and *Informal payment* dimension were of a sensitive nature.

Table 3. Taxonomy problems, Intraclass Correlation Coefficients (ICC), and Confirmatory factor analysis (CFA) for items and dimensions of the COACH tool

Dimension/ Sub-dimension/ Item	Taxonomy problems[a]	ICC(1,k)[b]	Factor loading of CFA	
			Scaled items	Non-scaled items
Organizational resources		**0.54**		
Human resources			*0.68*	
1. My unit has enough workers with the right training and skills to do everything that needs to be done.	I/E, minor	0.35	0.72	
2. My unit has enough workers with the right training and skills to do their job in the best possible way.	-	0.42	0.82	
Space			*0.58*	
3. My unit has enough space to provide healthcare services.	I/E, minor	0.58	1.00	
Communication & transport			*0.75*	
4. My unit has access to the transport and fuel that are needed to provide healthcare services.	Lex, prominent	0.29	0.50	
5. My unit has access to the communication tools (e.g. telephones or radios) that are needed to provide healthcare services.	Lex, prominent	0.56	0.62	
Medicines and equipment			*0.84*	
6. My unit has enough medicine to provide healthcare services.	Log, minor	0.59	0.59	
7. My unit has enough functional equipment, such as a thermometer and blood pressure cuff, to provide healthcare services.	I/E, minor	0.3	0.62	
8. My unit has enough disposable medical equipment, such as syringes, gloves and needles, to provide healthcare services.	-	0.55	0.62	

Item		Column A	Column B
9. If the workload increases, my unit can get additional resources such as medicine and equipment.	I/E, minor	0.59	0.51
Financing			*0.56*
10. My unit receives money according to an established financial plan.	Log, minor	0.44	0.58
11. My unit has money that we can decide how to use.	I/E, minor / Log, minor	0.63	0.52
Community engagement		**0.49**	
12. In my unit we ask community members what they think about the healthcare services that we provide.	-	0.42	0.53
13. In my unit we listen to what community members think about the healthcare services we provide.	-	0.34	0.56
14. In my unit we have meetings with community members to discuss health matters.	-	0.32	0.52
15. In my unit we encourage community members to contribute to improving the health of the community.	Lex, minor	0.46	0.68
16. In my unit we encourage other organizations to contribute to improving the health of the community.	Lex, minor / I/E, minor	0.45	0.64
Monitoring services for action		**0.54**	
17. I receive regular updates about my unit's performance based on information/data collected from our unit.	-	0.52	0.60
18. My unit discusses information/data from our unit in a regular, formal way, such as in regularly scheduled meetings.	-	0.54	0.65
19. My unit regularly uses unit information/data to make plans for improving its healthcare services.	-	0.34	0.65
20. My unit regularly monitors its work by comparing it with the unit's action plans.	-	0.54	0.53

Item			
21. My unit regularly compares its work with national or other guidelines.	I/E, minor	0.33	0.46
Sources of knowledge			
Structural sources		**0.72**	**0.94**
22. Clinical practice guidelines	-	0.64	0.75
23. Other printed material for work (e.g. textbooks, journals)	-	0.26	0.72
26. In-service training/ workshops/courses	C, minor	0.63	0.21
E-health	-	-	**0.82**
24. The Internet	-	0.89	0.74
25. Electronic decision support (e.g. mobile phone applications or other electronic devices to assist with care and decision-making)	Lex, prominent	0.19	0.63
Commitment to work	-	**0.61**	-
27. I am proud to work in this unit.	-	0.58	0.81
28. I am satisfied to work in this unit.	-	0.61	0.86
29. I feel encouraged to do my very best at work.	-	0.44	0.69
Work culture		**0.48**	**0.87**
Culture of learning and change			
30. My unit is willing to use new healthcare practices such as guidelines and recommendations.	-	-0.1	0.51
31. My unit helps me to improve and develop my skills.	-	0.35	0.67
32. I am encouraged to seek new information on healthcare practices.	Lex, minor	0.26	0.65
Culture of responsibility		**0.79**	
33. My unit works for the good of the patients and puts their needs first.	-	0.52	0.67
34. Members of the unit feel personally responsible for improving healthcare services.	-	0.43	0.66

35. Members of the unit approach patients with respect.	-	0.4	0.77
Leadership		**0.61**	
36. I trust the unit leader.	-	0.39	0.80
37. The leader handles stressful situations calmly.	Lex, minor	0.41	0.75
38. The leader actively listens, acknowledges, and then responds to requests and concerns.	-	0.41	0.78
39. The leader effectively resolves any conflicts that arise.	Lex, minor	0.64	0.78
40. The leader encourages the introduction of new ideas and practices.	-	0.56	0.64
41. The leader makes things happen.	-	0.64	0.62
Informal payment		**0.16**	
Informal payment			*0.87*
42. Patients must always give informal payment to health workers to access healthcare services.	-	0.32	0.87
43. Patients are treated more quickly if they make informal payments to health workers.	-	0.44	0.89
44. Medicines or equipment that should be available for free to patients have been sold in my unit.	-	0.55	0.83
45. Health workers are sometimes absent from work earning money at other places.	-	0.39	0.67
Nepotism			*0.85*
46. Health workers in my unit give healthcare services to friends and family first.	-	0.54	0.89
47. Health workers in my unit give jobs or other benefits to friends and family first.	-	0.53	0.89

Accountability			0.33
48. Efforts are made to stop patients from providing informal payment to get appropriate healthcare services.	Lex, prominent Log, prominent	0.5	0.90
49. Efforts are made to stop health workers from asking patients for informal payment.	Lex, prominent Log, prominent	0.07	0.93
Model-Data Fit			
N		666	672
χ^2 (*p*-value)		12819.2 (<0.001)	648.7 (<0.001)
df		946.000	10.000
RMSEA		0.049	0.102
SRMR		0.055	0.020
CFI		0.881	0.967
TLI		0.871	0.891

[a] Classification according to Conrad and Blair's taxonomy [98]: Lex (Lexical problems), I/E (Inclusion/ exclusion problems), Log (Logical problems), C (Computational problems)

[a] Magnitude of the problem's effect on response data: Prominent problem, Minor problem

[b] ICC (1,k): The intraclass correlation coefficient using the one-way random average measures of items and dimensions

df = degree of freedom, CFI = comparative fit index, TLI = the Tucker-Lewis Index, SRMR = standardized root mean squared residual, RMSEA = root mean square error of approximation

Testing the stability of the tool

The test-retest survey amongst 77 health workers (CHWs, nurses/midwives, and physicians) showed that two-thirds of the items and seven of eight dimensions had an ICC agreement ranging from moderate to substantial (0.5 to 0.7), suggesting that the tool had an acceptable level of stability.

Internal structure of the tool

The CFA asserted that the COACH tool had acceptable internal structure, which is robust evidence for the validity of the scores of the tool itself. The magnitude of the factor loadings of all items and all dimensions/sub-dimensions, except one item (26. *In-service training/workshops/courses*) in the *Sources of knowledge* dimension and the *Accountability* sub-dimension, were greater than the commonly used threshold value of 0.50 (Table 3).

Healthcare context for knowledge translation in Vietnam

Towards the end of 2014, the COACH tool was applied in a Vietnamese province targeting 677 eligible health workers working in primary and secondary levels of care (Figure 3). Study IV is one of the first surveys that attempts to describe the complex aspects of the healthcare context that influence KT as perceived by health workers at primary and secondary levels of care in an LMIC. Overall, the healthcare context was perceived as being supportive for KT. In other words, the results showed high scorings and a minor variability in respondents' perceptions of most of the dimensions of the healthcare context amongst health workers and units. For example, health workers rated *Leadership* with a mean of 4.1±0.3) and *Commitment to work* had a mean of 4.2±0.2 in a scale ranging from 1-5. On the unit level, significant variation between units was only found in the *Monitoring services for action* dimension.

The binary logistic regression asserted that three variables (age, sex, and facility setting) had significant associations to one of the COACH tool dimensions. For example, there were higher scorings in the *Leadership* dimension amongst health workers in urban facilities than those of their colleagues in rural facilities (OR=2.99, 95% CI: 1.12–10.38); and lower scores in the *Commitment to work* dimension among male health workers than those of female health workers (OR=0.39, 95% CI: 0.20–0.78).

Discussion

Through the four studies presented in this thesis, the evidence regarding reliability and validity of the newly developed COACH tool, measuring core aspects of context considered to be of importance to KT in LMICs, were investigated. To date, the tool is recognized as the first and only tool available to assess modifiable aspects of context considered to be of importance for KT in LMICs with promising psychometric characteristics. The translated tool can be used to facilitate research on contextual factors perceived to be of importance for KT in Vietnamese health facilities – an important prerequisite to improving quality of care. This thesis discussion highlights the following issues: (1) The development of a context measurement tool; (2) Psychometric properties of the COACH tool; and (3) Using the COACH tool to measure aspects of the healthcare context.

The development of a context measurement tool

Researchers in implementation science repeatedly highlight the need to document and understand the healthcare context [32, 33], placing specific emphasis on the attributes that influence the implementation of EBPs in LMICs [78, 89]. With information derived from a literature search, we found three tools based on the PARIHS framework aimed at assessing the healthcare context. This raised the question of whether to use the available tools to measure the aspects of context that influence KT in LMICs. Notably, these tools do not include a number of attributes that have been perceived to be of importance for KT in LMICs, such as the engagement of the community, commitment to work and informal payment [70, 71, 104]. Therefore, departing from the results of the literature review, we began the process of developing and testing a new tool.

The COACH tool has been developed to satisfy a number of criteria, including: (1) being based on a sound framework and available evidence; (2) assessing potentially modifiable aspects of the healthcare context that influence KT; (3) being applicable for use with various health worker groups across different LMICs, with a particular focus on workers in primary and secondary healthcare levels; (4) brevity; and (5) having acceptable psychometric properties. The initial validation of the COACH tool, developed

and tested across multiple LMICs and health worker groups, had advantages when comparing it to the process of similar tools, such as ACT, CAI, and ORCA. The initial validation of the ACT, for example, was only conducted in one Canadian pediatric care hospital with one professional group, and with a moderate sample size [35].

The COACH tool development had major challenges in being broad enough to cover differences of context within and between settings, but also specific enough to include crucial aspects of the healthcare context. Further, health workers' level of education and the roles of different groups may differ between settings. CHWs in Vietnam, for example, had different roles when comparing them to the other four countries where the tool was developed [63]. The newly developed COACH tool, thereby, asserted the potential to have an overarching approach to provide insight into common factors influencing the implementation of EBPs in LMICs.

Dimensions of context of importance for knowledge translation

In comparison to other tools [35, 63], the new eight-dimension COACH tool has, at least, three unique dimensions (*Informal payment*, *Commitment to work* and *Community engagement*), that have particular resonance in LMICs. Out of these three dimensions, the two dimensions, *Commitment to work,* and *Community engagement*, have also been reported to be important for KT in high-income countries [105, 106].

Informal payment has repeatedly been emphasized as an influential factor in the implementation and provision of EBP in LMICs [71, 107]. In Vietnam, *Informal payment* in the health sector is a national concern which could derail health sector goals for equity, access, and quality [108]. Offering cash directly and paying cash in envelopes to health workers are the most common ways of making *Informal payments* in health services in Vietnam [109]. Yet, *Informal payment* goes largely unreported and there is little research on the frequency and scope of the problem, which generates a threat to addressing the problem. Representative data on the amount of *Informal payments* can only be obtained from indirect sources such as household surveys and some corruption surveys of international organizations, such as the World Bank and Transparency International [107]. Further, these sources, whenever used, only provide an estimation of the frequency and cost of *Informal payment* but not its influence on service provision. Comparing among the five countries where the COACH tool was developed, the scores for the *Informal payment* items in the COACH tool aligned with the Transparency International Corruption Perceptions Index, that is, the higher the corruption index of a country, the more likely health workers were to agree with any of *Informal payment* items in the COACH tool [110]. From this perspective, the COACH

tool provides an opportunity to study the influence of *Informal payment* on EBPs in LMICs.

Another aspect of context in the COACH tool is *Commitment to work*. Having a high level of commitment has been reported as a crucial attribute in achieving high job satisfaction and motivation, which results in higher service delivery quality and patient satisfaction in Vietnam, especially in rural areas [104, 111]. A high proportion of health workers in Vietnam, especially at the lower level of the healthcare system, are not satisfied with their compensation and benefits, working conditions, and career opportunities [111-113]. Senior health workers are also likely to have lower commitment to work and more likely to move from lower to higher health system levels and/or from rural to urban areas [114]. Further, *Commitment to work* has also been perceived to be important for KT in high-income countries. Low motivation and poor staff satisfaction lead to insufficient KT and weak health service performance [105]. Measuring health workers' *Commitment to work* would benefit the understanding of their work performance and job motivation.

The third unique dimension of context in the COACH tool is *Community engagement*. In Study I, we highlighted that local key stakeholders were in positions to initiate useful collaborative activities within their communes. There were a number of local stakeholders, such as the Women's Union and the Youth Union, which could affect and foster the healthcare activities in communes. Rooting their networks at all administrative levels in the Vietnamese healthcare system, members of these unions, particularly the representatives of the Women's Union, are able to connect and reach most women [115, 116]. The strengthening of the linkage between health workers and the local stakeholders has also been proven in other KT interventions in LMICs, such as in the results of an under-five mortality intervention in Uganda [117] and the NeoKIP project in Vietnam [93]. Similar to *Commitment to work*, there has also been a strong push towards active communication with and the engagement of stakeholders in KT interventions in high-income countries [106].

Equivalence between the original and translated versions

Challenges in the translation process arose from the contradictory requirements between keeping as close as possible to the meaning of the dimensions and items in the original version and having a reliable and valid tool in the translated version. During the development of the COACH tool, we struggled to find translations that: (1) were understood by health workers in different settings; (2) did not alter the meaning of the original concepts/words; and (3) were concise. Similar to the translation process for other tools, this needed careful rounds of forward and backward translation, which were time consuming and required rigorous comparison between the original and

the translated versions [68, 118]. Semantic equivalence, that is, finding appropriate wordings that have the same meaning for respondents of both versions, was the most difficult element to achieve. We discovered some incongruence between terms that captured the essence of the meaning of dimensions and items in the translation process despite the many rounds of extensive discussions. The *Informal payment* dimension was the most challenging to translate, that is, we could not find an easy-to-understand depiction of the concept of *Informal payment* in Vietnam. However, in the Vietnamese version of the tool, *Informal payments* was translated into *money and gift ('envelope' or 'under-table' payment)*.

Other examples of concepts that were challenging to translate included items such as *Electronic decision support (e.g. mobile phones or other electronic devices to assist with care and decision-making)* and *Reminder systems (e.g. notices via e-mail)*. These items related to electronic types of *Sources of information,* which were not always available and were hence difficult to describe in some settings.

To understand the original concepts, avoid pitfalls, and ensure equivalence, our translation process was undertaken primarily by the different country-specific researchers and the tool-developing group. The group possessed an in-depth understanding of the concepts in the tool as well as of the target setting and target population. This was essential to ensure equivalent translation and cultural adaptation between the original and the translated versions [67, 68].

A rigorous translation process was necessary but not sufficient to ensure comparable, reliable, and valid translations. Comprehensiveness of the tool in the target population was assessed through the response process by using think-aloud interviews amongst eligible respondents. The exploratory factor analysis showed that the items within each dimension fitted well with the theoretical constructs across all countries, suggesting that the original and translated versions were equivalent. The overall translation process of the COACH tool might be used to facilitate translations of similar tools into Vietnamese or other languages.

Psychometric properties of the COACH tool used in Vietnam

Studies III and IV were the first studies providing specific insights on validity and reliability of the COACH tool in Vietnam. Three additional sources of evidence regarding validity of the COACH tool have been provided, that is, response processes, stability, and internal instrument structure [94]. This robust quantitative evidence supplemented the results of the initial validation of the COACH tool (Study II), indicating that the translated version of the tool retains good psychometric properties.

Response process

We applied think-aloud interviews to explore how respondents comprehended the dimensions and items (Study III). One of the difficulties of this exploration was to avoid subjectivity, a potential flaw when analyzing think-aloud interviews [119]. To avoid this flaw we applied a structured approach by the application of Conrad and Blair's taxonomy [119]. We found 19 of the 49 items indicated a level of concern, which could raise questions regarding the comprehensiveness of the tool. However, our additional classification of all the identified problems using an estimation of the magnitude of the problem's effect on the response (either minor or prominent) reduced the number of items that needed consideration to five (Table 3). Lexical problems were the most common problems, which implied a need to review the translation of these items.

Sensitive issues relating to the *Commitment to work*, *Leadership*, and *Informal payment* dimensions were, to some extent, expected. Informal payment is particularly difficult to measure, especially in LMICs [108, 120]. Social desirability bias has also been reported in research measuring *Commitment to work* [121, 122] and *Leadership* [123]. Collecting data that reflect respondents' thoughts about sensitive issues contains a risk of bias. In Study IV, social desirability response bias is a potential explanation for the high proportion of skewed scores amongst the health workers. To minimize the risk of social desirability bias, it is important to ensure that participants understand that their responses will be handled confidentially. Each respondent, for example, could complete the tool in a secluded area, instead of sitting together with their colleagues [124]. Anonymity, confidentiality, and using a non-judgmental tone have been reported as strategies to adopt to enhance the opportunities to obtain sincere answers from respondents [125, 126].

Stability

The COACH tool had moderate to substantial ICC values in seven out of eight dimensions, asserting an acceptable level of stability for the responses, which was achieved by repeated applications. The ICC values for each dimension, ranging from 0.5–0.7, are similar to those found in psychometric evaluations of other tools measuring work context [127, 128], and a tool evaluating the application of clinical guidelines in Sweden [129]. In terms of items, one-third had poor ICC values (≤ 0.40). This could partly be due to the relatively homogeneous scorings in the test-retest survey (high proportion of right-side skewed responses) [130]. Further, one-third of the items with poor ICC values contained prominent taxonomy problems. This highlights that think-aloud interviews are important to perform ahead of using instruments for surveys to revise and improve the stability of the items of a tool.

Internal structure

A first-order independent cluster model CFA was calculated to assess the internal structure of the COACH tool, that is, evaluating the loading of items to a latent structure, when completed by health workers in Vietnam. Bearing in mind the existence of *scaled* and *non-scaled* dimensions in the COACH tool, three different analytic models were performed. The high magnitude of factor loadings asserted the acceptable internal structure of the COACH tool's eight proposed theoretical dimensions, supported the structure of the COACH tool, and advanced its validity evidence. Our CFA and factor loading findings were similar with the findings of the validation studies of other tools, such as the ACT [53, 131], and the ORCA [57].

Measuring aspect of healthcare context

One aim of the COACH tool was to measure aspects of context perceived to be of importance for KT in LMICs. The cross-sectional survey in Quang Ninh province (Study IV) showed a relatively positive perception of all dimensions, that is, a context receptive to KT. The data, however, were severely skewed to the right with a minor variability in both scores at the individual level (health workers) and aggregated level (healthcare units) in most of the dimensions. The high scoring of context implies an environment that is more receptive to change as it represents a good work culture, and strong leadership and supervision systems [49]. While our results could be interpreted as showing a supportive healthcare context for KT in Vietnam, it might also be a consequence of social desirability response bias. The COACH tool has not previously been applied to study the association between healthcare contextual factors and KT in any LMIC. Thus, further efforts to investigate the scores of context among health workers should be undertaken as well as an exploration of how these scores can be associated with KT interventions and successful implementations of EBPs.

Another difficulty experienced in using the COACH tool was the lack of information needed for CHWs to provide answers to some items. CHWs only worked part-time as healthcare workers and were mostly active outside the CHC. CHWs lacked knowledge about the finance of the CHC and accessibility to the sources of knowledge available in health centers. This implied that the COACH tool could be difficult to use with CHWs in Vietnam. One option to address this problem might be to exclude items that are not relevant to CHWs.

Methodological considerations

Although the 16 FGDs in Study I were primarily conducted to explore the facilitation process, the information was saturated concerning aspects of context, which enabled us to perform a secondary analysis [132, 133]. Many factors were found to mutually relate to and influence both context and facilitation. An explanation is that participants in interventions are not only passively perceived but also interact with the intervention activities that result in co-producing outcomes [134]. However, further interviews in the control communes during the NeoKIP trial could have been useful to deepen the understanding of aspects of context in relation to the facilitation of the intervention.

The deletion of items was always carefully considered during the development process of the COACH tool. The group strived to avoid deleting items too quickly, but rather aimed to reduce the number of items with caution. One example was the lowering of the cut-off value for I-CVI from 0.78 to 0.67 during Phase III in order to retain the e-health items under the *Sources of knowledge* dimension. Further, the *Sources of knowledge* dimension did not reach the Cronbach's alpha coefficient cut-off ($\geq$0.7). We, however, decided to keep all items in the *Sources of knowledge* dimension because they were considered important.

Test-retest reliability for items and dimensions was applied using intraclass correlation coefficient with one-way random average measure [ICC (1,k)] (Study III) [135]. Choosing the appropriate test-retest reliability coefficient was not easy as there has been considerable debates in the literature regarding current options, in particular, the popular use of Cohen's Kappa coefficient and/or the weighted Kappa for nominal scales [136]. The ICC measure was chosen because it has a number of advantages over the Kappa coefficient, such as the ability to isolate factors affecting reliability [137, 138]. Having very few missing responses, the test-retest reliability was also an advantage. One could wonder whether the various time intervals in our test-retest (6–14 weeks) strategy might have influenced the findings. We consider, however, that the trait of context perceived to be of importance for KT is normally a stable construct over a period of 3.5 months, the distance between time intervals in our study period [139].

CFA models have been reported to be the best models for computing internal structure for scales such as the COACH tool [53]. The low factor loading of the *Accountability* sub-dimension in the *Informal payment* dimension, despite the high magnitude of loading of the included items, could be explained by the method effects emerging from the composition of both positively and negatively worded items in the dimension [101].

Conclusion

A consistent finding in health services research is that the use of EBPs is suboptimal, particularly in LMICs. The contexts in which the services are being provided are perceived to be of importance for the implementation of proposed changes. However, contextual factors are generally not well understood and, prior to the start of this thesis, no completely satisfactory measure of the aspects of context that are of importance to KT was available for use in LMICs. To date, the COACH tool is the first and has been specifically developed to assess core and modifiable dimensions of context of importance for KT in LMICs. The studies in this thesis indicated that the COACH tool had promising psychometric characteristics. It is currently available to use for health workers in different professions and has been translated into six languages: Bangla (Bangladesh), isiXhosa (South Africa), Lusoga (Uganda), Portuguese (Mozambique), Spanish (Nicaragua), and Vietnamese (Vietnam).

The Standards for Educational and Psychological Testing guided the initial and further psychometric assessment of the COACH tool. During its initial development, the COACH tool was assessed for *content validity*, *response process validity*, *internal structure*, and *reliability*. The initial assessment asserted the acceptable reliability and validity of the tool. The subsequent studies demonstrated that the COACH tool, after translation to Vietnamese, was clear, well organized, and easy to answer (response process using think-aloud) with an acceptable level of stability (test-retest). Finally, the CFA revealed that the COACH tool had an acceptable internal structure. The evidence provided regarding the most common sources of validity and reliability of an instrument suggested that the translated version of the COACH tool was useful for research on contextual factors perceived to be of importance to KT in Vietnamese health facilities.

Whilst departing from similar tools to measure healthcare context in high-income settings, the COACH tool added three new dimensions of context found to be relevant in LMICs (*Informal payment*, *Commitment to work*, and *Community engagement*). The tool could be applied as a means of characterizing context prior to KT interventions, as a method for tailoring a KT strategy to adapt a specific context, and for further understanding of the outcomes of these efforts. The tool had the potential to generate better understanding of the process of implementing EBPs in LMICs.

The first two surveys conducted to provide a comprehensive account of the healthcare context in Vietnam showed a relatively homogenous positive perception of all dimensions, that is, a context receptive to KT. These results should, however, be interpreted with caution, due to a potential risk of social desirability response bias, which was a concern given that the Vietnamese people often avoid providing accurate responses to sensitive questions. Collecting data amongst CHWs in Vietnam was also a challenge as these part-time staff lacked information regarding their health centers to be able to adequately answer some items of the COACH tool.

This thesis addressed the prevailing request regarding a measurement tool for aspects of the healthcare context that are considered to be of importance for KT in LMICs. Understanding the healthcare context for EBP was an important prerequisite to improve the quality of care and thus the quality of life for people. We encouraged further investigations relating to the validity and reliability of the COACH tool whenever the research context permits.

Acknowledgements

In doctoral study, as in life, in all cases, no one makes this journey all alone. Family members, relatives, tutors, colleagues, classmates, friends, and even those random people you meet daily are all important and vital to your arrival at the destination.

This doctoral project was a shared venture between the Faculty of Medicine, Department of Women's and Children's Health, at the smaller unit of the International Maternal and Child Health (IMCH), and the Uong Bi General Hospital. First and foremost, I am grateful to the facilitators, primary health care workers, data collectors, and inhabitants of Quang Ninh province who participated in all four studies of this thesis. My hope is that this thesis will contribute as one piece within a much larger knowledge puzzle: without you that would not have been possible. I am also indebted to Hanoi University of Public Health who generously invested in my project by allowing and supporting my fieldwork and other extra work during my entire doctoral study.

I am indebted to my team of supervisors: this team, made up of Swedish and Vietnamese experts, has really blended well and allowed me to learn tons of new things from each of them and their ways of thinking. All together they have given me lots of inspiration!

I thank my main supervisor, Lars Wallin, who believed in me, for this educational opportunity, and for always having time for questions and discussions. Lars, I am really grateful for all the times I visited your home, meeting your wife (Anna Ehrenberg) and your sons (Jacob, Jesper, and Johan), and enjoying a real family in Sweden. Thanks for your support, encouragement, and understanding during all these years. Not only have you been an incredible supervisor, but also you were a great mentor and supportive friend. Your passion for knowledge translation and research is incredible, a true researcher and a good role model! To Anna E., you and Lars are always my Swedish parents. I will never forget your excellent food! Both of you have given up a lot of your free time to teach me everything about Sweden, such as skiing, boat rowing. Thanks for your trust in me and for giving me the space to be independent while always being there to support and lead me. I never could come to this day without both of your excellent supervision.

I am very grateful to my co-tutor, Anna Bergström, for all of your great contributions to my papers. You are such a wonderful person to work with! Thanks for continuously having stimulated me with new perspectives, for

providing me with constructive and fruitful suggestions, and for your distinguished skills in writing. Not only you are a great researcher, but also you are one of the most generous and kindest persons that I have ever met!

To my third co-tutor, Leif Eriksson, I offer a profound thank you for your enormous support for my doctoral life in Uppsala and your generosity, inspiration, and thorough supervision of my doctoral journey. Without you, I would never have completed this. I really appreciate the opportunity of knowing you, Leif. My doctoral life in Sweden was so great with your help!

To my last co-tutor, Bui Thi Thu Ha, as my first teacher in my bachelor's program, you initiated the inspirational spark that would carry me forward into the reproductive health field. As a result of more than 10 years of working under your supervision, I could continue and have now ended my doctoral journey. Thanks so much for believing in my abilities, facilitating my work, and sharing the gift of your talents: your eye for details and your role in touching the prioritized issues in every part of my work.

I have had the opportunity to get to know and have been mentored by a number of people during this journey. I would especially like to thank Dinh Thi Phuong Hoa, Nguyen Thi Nga, Lars-Åke Persson, Uwe Ewald, and Mats Målqvist for giving me the chance to work on the NeoKIP project and later, on the COACH project. I am also indebted to my co-authors, Ann Catrine Eldh and Katarina Selling, for their great contributions to my papers with their excellent skills in qualitative and quantitative analysis. Sharing your experiences, both scientifically and personally, were precious to me! Thank you for your trust in me.

I am very thankful to Marta Gislason, for giving me a chance to be her tenant during most of my time working and learning in Uppsala. My life was so much easier when staying in your beloved apartment with all your pets.

Thank you to all staff and fellow doctoral students at IMCH, past and present, who always have been supportive and who keep the IMCH ship running. Thanks for your unique contributions in making IMCH a welcoming and "learning-rich" place. For administrative care and comfort, I owe big thanks for smiles and services rendered, to Karin, Christina, Kristine, Hanna T., Martin, Jenny, and Hanna A. Special thanks to, Jill, Shirin, Soorej, Malin, Aimable, Amal, Amare, and Anna A., for your friendship, support, and kindness. You have been at IMCH during all my years, you have always believed in me and encouraged my work. Thanks also to all the members of the qualitative group at IMCH, for your teaching me many decent qualitative methodologies and analysis.

To all my colleagues at Hanoi University of Public Health, this thesis has been indelibly marked and shaped by your shared experiences and wisdom born of research in public health.

Above all, I would like to sincerely thank my beloved family, my parents (Van and Thuan), my sister (Hien) and her husband (Thanh), my parents-in-

law (Tri and Tuyen), my wife (Chi), my sisters-in-law (Mai and Trang), and my two children (Sau and Soc). I love you all! Mom and dad, you are the most amazing parents that anyone could have. You never stopped loving me, supporting me, and encouraging me. I am also deeply indebted to my mother-in-law for the endless support to our family through these years.

To my beloved children Sau and Soc; you have been the most wonderful gifts. You provided your lovely smiling and questions to refresh my mind and to make the world a better place.

To Chi, after ten plus years of knowing, I think your love lights my world. Your love, support, and wisdom, have been the most important to me. Thanks for being there, for your encouragement, and for taking care of our children during my times in Sweden.

Please forgive me if I have overlooked someone, you know who you are and how important you are to me.

References

1. Straus S, Tetroe J, Graham ID: *Knowledge Translation in Health Care: Moving from Evidence to Practice.* Toronto: Wiley; 2013.
2. Rycroft-Malone J, Seers K, Titchen A, Harvey G, Kitson A, McCormack B: **What counts as evidence in evidence-based practice?** *J Adv Nurs* 2004, **47:**81-90.
3. Fineout-Overholt E, Levin RF, Melnyk BM: **Strategies for advancing evidence-based practice in clinical settings.** *J N Y State Nurses Assoc* 2004, **35:**28-32.
4. Ciliska D: **Evidence-based nursing: How far have we come? What's next?** *Evid Based Nurs* 2006, **9:**38-40.
5. Straus S, Glasziou P, Richardson SW, Haynes RB: *Evidence-Based Medicine: How to Practice and Teach It.* 4th edn. Edinburgh: Churchill Livingstone; 2010.
6. DiCenso A, Guyatt G, Ciliska D: *Evidence-based Nursing: A Guide to Clinical Practice.* Elsevier Mosby; 2005.
7. Houser J, Oman KS: *Evidence-based practice: An implementation guide for healthcare organizations.* Sudbury, MA: Jones & Bartlett Publishers; 2010.
8. Grol R: **Successes and failures in the implementation of evidence-based guidelines for clinical practice.** *Med Care* 2001, **39:**II46-54.
9. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS: **How many child deaths can we prevent this year?** *Lancet* 2003, **362:**65-71.
10. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N: **Lost in knowledge translation: time for a map?** *J Contin Educ Health Prof* 2006, **26:**13-24.
11. Grol R, Grimshaw J: **From best evidence to best practice: effective implementation of change in patients' care.** *Lancet* 2003, **362:**1225-1230.
12. Richardson WC, Berwick DM, Bisgard J, Bristow L, Buck C, Cassel C: **Crossing the quality chasm: a new health system for the 21st century.** Washington, DC: Institute of Medicine, National Academy Press Washington, DC; 2001.
13. Morris ZS, Wooding S, Grant J: **The answer is 17 years, what is the question: understanding time lags in translational research.** *J R Soc Med* 2011, **104:**510-520.

14.   Rycroft-Malone J, Kitson A, Harvey G, McCormack B, Seers K, Titchen A, Estabrooks C: **Ingredients for change: revisiting a conceptual framework.** *Qual Saf Health Care* 2002, **11:**174-180.

15.   Santesso N, Tugwell P: **Knowledge translation in developing countries.** *J Contin Educ Health Prof* 2006, **26:**87-96.

16.   Stetler CB, Brunell M, Giuliano KK, Morsi D, Prince L, Newell-Stokes V: **Evidence-based practice and the role of nursing leadership.** *J Nurs Adm* 1998, **28:**45-53.

17.   McKibbon K, Lokker C, Wilczynski N, Ciliska D, Dobbins M, Davis D, Haynes R, Straus S: **A cross-sectional study of the number and frequency of terms used to refer to knowledge translation in a body of health literature in 2006: a Tower of Babel?** *Implement Sci* 2010, **5:**16.

18.   **About knowledge translation & commercialization** [http://www.cihr-irsc.gc.ca/e/29418.html]

19.   Salbach NM: **Knowledge Translation, Evidence-Based Practice, and You.** *Physiother Can* 2010, **62:**293-294.

20.   Rycroft-Malone J, Stetler CB: **Commentary on Evidence, Research, Knowledge: A Call for Conceptual Clarity: Shannon Scott-Findlay & Carolee Pollock.** *Worldviews Evid Based Nurs* 2004, **1:**98-101.

21.   **Bridging the "Know-Do" Gap: Meeting on knowledge translation in global health. 10-12 October 2005** [http://www.who.int/kms/WHO_EIP_KMS_2006_2.pdf]

22.   **Knowledge translation strategies** [http://www.cihr-irsc.gc.ca/e/29418.html]

23.   Milner M, Estabrooks CA, Myrick F: **Research utilization and clinical nurse educators: A systematic review.** *J Eval Clin Pract* 2006, **12:**639-655.

24.   Squires JE, Estabrooks CA, Gustavsson P, Wallin L: **Individual determinants of research utilization by nurses: a systematic review update.** *Implement Sci* 2011, **6:**1-20.

25.   Greenhalgh T, Robert G, Bate P, Kyriakidou O, Macfarlane F, Peacock R: *How to spread good ideas: A systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organisation.* London: National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO); 2004.

26.   Davis D, Davis ME, Jadad A, Perrier L, Rath D, Ryan D, Sibbald G, Straus S, Rappolt S, Wowk M, Zwarenstein M: **The case for knowledge translation: shortening the journey from evidence to effect.** *BMJ* 2003, **327:**33-35.

27.   Harvey G, Kitson A: **PARIHS revisited: from heuristic to integrated framework for the successful implementation of knowledge into practice.** *Implement Sci* 2016, **11:**33.

28. Rogers EM: *Diffusion of Innovations.* 5th edn. New York, NY: Free Press; 2003.

29. Glasziou P, Meats E, Heneghan C, Shepperd S: **What is missing from descriptions of treatment in trials and reviews?** *BMJ* 2008, **336:**1472-1474.

30. Rodgers SE: **A study of the utilization of research in practice and the influence of education.** *Nurse Educ Today* 2000, **20:**279-287.

31. McCormack B, Kitson A, Harvey G, Rycroft-Malone J, Titchen A, Seers K: **Getting evidence into practice: the meaning of 'context'.** *J Adv Nurs* 2002, **38:**94-104.

32. Wallin L, Ewald U, Wikblad K, Scott-Findlay S, Arnetz BB: **Understanding work contextual factors: a short-cut to evidence-based practice?** *Worldviews Evid Based Nurs* 2006, **3:**153-164.

33. Cummings GG, Estabrooks CA, Midodzi WK, Wallin L, Hayduk L: **Influence of organizational characteristics and context on research utilization.** *Nurs Res* 2007, **56:**S24-39.

34. McCormack B, McCarthy G, Wright J, Slater P, Coffey A: **Development and testing of the Context Assessment Index (CAI).** *Worldviews Evid Based Nurs* 2009, **6:**27-35.

35. Estabrooks C, Squires J, Cummings G, Birdsell J, Norton P: **Development and assessment of the Alberta Context Tool.** *BMC Health Serv Res* 2009, **9:**234.

36. West E, Barron DN, Dowsett J, Newton JN: **Hierarchies and cliques in the social networks of health care professionals: implications for the design of dissemination strategies.** *Soc Sci Med* 1999, **48:**633-646.

37. Locock L, Dopson S, Chambers D, Gabbay J: **Understanding the role of opinion leaders in improving clinical effectiveness.** *Soc Sci Med* 2001, **53:**745-757.

38. Long JC, Cunningham FC, Braithwaite J: **Bridges, brokers and boundary spanners in collaborative networks: a systematic review.** *BMC Health Serv Res* 2013, **13:**1-13.

39. Wensing M, Elwyn G, Grol R: **Patient-mediated strategies.** In *Improving Patient Care: The Implementation of Change in Clinical Practice.* Edinburgh: Butterworth-Heineman; 2005: 185-196

40. Bucknall T, Kent B, Manley K: **Evidence Use and Evidence Generation in Practice Development.** In *International Practice Development in Nursing and Healthcare.* London: Blackwell Publishing Ltd.; 2009: 84-104

41. Kitson A, Harvey G, McCormack B: **Enabling the implementation of evidence based practice: a conceptual framework.** *Qual Health Care* 1998, **7:**149-158.

42. Stetler C: **Stetler model.** In *Models and Frameworks for Implementing Evidence-Based Practice: Linking Evidence to Action.* Oxford, UK: Wiley-Blackwell; 2013

43. Rycroft-Malone J, Bucknall T: *Models and Frameworks for Implementing Evidence-Based Practice: Linking Evidence to Action.* John Wiley & Sons; 2010.

44. Sudsawad P: **Knowledge translation: Introduction to models, strategies, and measures.** *Austin, TX: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research* 2007.

45. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC: **Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science.** *Implement Sci* 2009, **4:**50.

46. May C, Finch T: **Implementing, Embedding, and Integrating Practices: An Outline of Normalization Process Theory.** *Sociology* 2009, **43:**535-554.

47. Nilsen P: **Making sense of implementation theories, models and frameworks.** *Implement Sci* 2015, **10:**1-13.

48. Rycroft-Malone J: **Theory and knowledge translation: setting some coordinates.** *Nurs Res* 2007, **56:**S78-85.

49. Rycroft-Malone J, Harvey G, Seers K, Kitson A, McCormack B, Titchen A: **An exploration of the factors that influence the implementation of evidence into practice.** *J Clin Nurs* 2004, **13:**913-924.

50. Kitson AL, Rycroft-Malone J, Harvey G, McCormack B, Seers K, Titchen A: **Evaluating the successful implementation of evidence into practice using the PARiHS framework: theoretical and practical challenges.** *Implement Sci* 2008, **3:**1.

51. Estabrooks CA, Squires JE, Hayduk LA, Cummings GG, Norton PG: **Advancing the argument for validity of the Alberta Context Tool with healthcare aides in residential long-term care.** *BMC Med Res Methodol* 2011, **11:**107.

52. Hoben M, Bar M, Mahler C, Berger S, Squires J, Estabrooks C, Kruse A, Behrens J: **Linguistic validation of the Alberta Context Tool and two measures of research use, for German residential long term care.** *BMC Res Notes* 2014, **7:**67.

53. Squires JE, Hayduk L, Hutchinson AM, Mallick R, Norton PG, Cummings GG, Estabrooks CA: **Reliability and Validity of the Alberta Context Tool (ACT) with Professional Nurses: Findings from a Multi-Study Analysis.** *PLoS One* 2015, **10:**e0127405.

54. Helfrich CD, Damschroder LJ, Hagedorn HJ, Daggett GS, Sahay A, Ritchie M, Damush T, Guihan M, Ullrich PM, Stetler CB: **A critical synthesis of literature on the promoting action on research implementation in health services (PARIHS) framework.** *Implement Sci* 2010, **5:**82.

55. Rycroft-Malone J, Seers K, Chandler J, Hawkes CA, Crichton N, Allen C, Bullock I, Strunin L: **The role of evidence, context, and facilitation in an implementation trial: implications for the development of the PARIHS framework.** *Implement Sci* 2013, **8:**28.

56. Tabak RG, Khoong EC, Chambers DA, Brownson RC: **Bridging research and practice: models for dissemination and implementation research.** *Am J Prev Med* 2012, **43:**337-350.

57. Helfrich C, Li Y-F, Sharp N, Sales A: **Organizational readiness to change assessment (ORCA): Development of an instrument based on the Promoting Action on Research in Health Services (PARIHS) framework.** *Implement Sci* 2009, **4:**38.

58. Davies H, Nutley S, Mannion R: **Organisational culture and quality of health care.** *Quality in Health Care : QHC* 2000, **9:**111-119.

59. Manley K: **Transformational Culture: A Culture of Effectiveness.** In *Practice Development in Nursing.* Oxford: Blackwell Publishing Ltd; 2008: 51-82

60. Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard-Jensen J, French SD, O'Brien MA, Johansen M, Grimshaw J, Oxman AD: **Audit and feedback: effects on professional practice and healthcare outcomes.** *Cochrane Database Syst Rev* 2012**:**Cd000259.

61. Grimshaw J, Eccles M, Lavis J, Hill S, Squires J: **Knowledge translation of research findings.** *Implement Sci* 2012, **7:**50.

62. Ellen ME, Lavis JN, Ouimet M, Grimshaw J, Bédard P-O: **Determining research knowledge infrastructure for healthcare systems: a qualitative study.** *Implement Sci* 2011, **6:**1-5.

63. Bergström A, Skeen S, Duc DM, Blandon EZ, Estabrooks C, Gustavsson P, Hoa DT, Kallestal C, Malqvist M, Nga NT, et al: **Health system context and implementation of evidence-based practices-development and validation of the Context Assessment for Community Health (COACH) tool for low- and middle-income settings.** *Implement Sci* 2015, **10:**120.

64. Baker R, Camosso-Stefinovic J, Gillies C, Shaw EJ, Cheater F, Flottorp S, Robertson N: **Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes.** *Cochrane Database Syst Rev* 2010**:**Cd005470.

65. Estabrooks CA, Birdsell JM, Cummings G, Squires JE, Newton MS, Norton PG: **Development of the Alberta Context Tool (ACT I).** pp. 31: University of Alberta; 2009:31.

66. Estabrooks CA, Squires JE, Adachi AM, Kong L, Norton PG: *Utilization of Health Research in Acute Care Settings in Alberta Technical Report (Report No. 08-01-TR)*. Edmonton, AB: Faculty of Nursing, University of Alberta; 2008.

67. Hoben M, Mahler C, Bar M, Berger S, Squires J, Estabrooks C, Behrens J: **German translation of the Alberta context tool and two measures of research use: methods, challenges and lessons learned.** *BMC Health Serv Res* 2013, **13:**478.

68. Eldh A, Ehrenberg A, Squires J, Estabrooks C, Wallin L: **Translating and testing the Alberta context tool for use among nurses in Swedish elder care.** *BMC Health Serv Res* 2013, **13:**68.

69. Cummings GG, Hutchinson AM, Scott SD, Norton PG, Estabrooks CA: **The relationship between characteristics of context and research utilization in a pediatric setting.** *BMC Health Serv Res* 2010, **10:**168.

70. Duc DM, Bergstrom A, Wallin L, Bui HT, Eriksson L, Eldh AC: **Exploring the influence of context in a community-based facilitation intervention focusing on neonatal health and survival in Vietnam: a qualitative study.** *BMC Public Health* 2015, **15:**814.

71. Bergström A, Peterson S, Namusoko S, Waiswa P, Wallin L: **Knowledge translation in Uganda: A qualitative study of Ugandan midwives' and managers' perceived relevance of the sub-elements of the context cornerstone in the PARIHS framework.** *Implement Sci* 2012, **7:**117.

72. United Nations: *The Millennium Development Goals Report 2015*. New York: United Nations; 2015.

73. Tugwell P, Robinson V, Grimshaw J, Santesso N: **Systematic reviews and knowledge translation.** *Bull World Health Organ* 2006, **84:**643-651.

74. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L: **Evidence-based, cost-effective interventions: how many newborn babies can we save?** *Lancet* 2005, **365:**977-988.

75. Young T, Garner P, Clarke M, Volmink J: **Evidence-based health care and policy in Africa: past, present, and future.** *J Clin Epidemiol* 2016.

76. Garner P, Meremikwu M, Volmink J, Xu Q, Smith H: **Putting evidence into practice: how middle and low income countries "get it together".** *BMJ* 2004, **329:**1036-1039.

77. Haines A, Kuruvilla S, Borchert M: **Bridging the implementation gap between knowledge and action for health.** *Bull World Health Organ* 2004, **82:**724-731.

78. Siddiqi K, Newell J, Robinson M: **Getting evidence into practice: what works in developing countries?** *Int J Qual Health Care* 2005, **17:**447-454.

79.   Prost A, Colbourn T, Seward N, Azad K, Coomarasamy A, Copas A, Houweling TA, Fottrell E, Kuddus A, Lewycka S, et al: **Women's groups practising participatory learning and action to improve maternal and newborn health in low-resource settings: a systematic review and meta-analysis.** *Lancet* 2013, **381:**1736-1746.

80.   Blacklock C, Gonçalves Bradley DC, Mickan S, Willcox M, Roberts N, Bergström A, Mant D: **Impact of Contextual Factors on the Effect of Interventions to Improve Health Worker Performance in Sub-Saharan Africa: Review of Randomised Clinical Trials.** *PLoS One* 2016, **11:**e0145206.

81.   Bergström A: **Evidence and context: knowledge translation for newborn health in low-income settings.** Karolinska Institutet, 2012.

82.   Vietnam Ministry of Health, Health Partnership Group: *Joint Annual Health Review 2010: Vietnam's Health System on the Threshold of the Five-year Plan 2011-2015.* Hanoi: Vietnam Medical Publishing House; 2010.

83.   **Vietnam health system and health infrastructure: achievements, challenges and orientation** [www.designandhealth.com/upl/files/122262/pam-le-tuan-2015.pdf]

84.   Vietnam Ministry of Health, Health Partnership Group: *Joint Annual Health Review 2013: Towards Universal Health Coverage.* Hanoi: Vietnam Medical Publishing House; 2013.

85.   **Health Service Delivery Profile: Vietnam** [http://www.wpro.who.int/health_services/service_delivery_profile_ vietnam.pdf?ua=1]

86.   Prime Minister of Vietnam: **Approval of national strategy for health protection, care and promotion of the population during period 2011–2020, and vision to 2030.** vol. 122/QĐ-TTg. Hanoi: Vietnam Government,; 2013.

87.   Le D-C, Kubo T, Fujino Y, Pham T-M, Matsuda S: **Health Care System in Vietnam: Current Situation and Challenges.** *Asian Pacific Journal of Disease Management* 2010, **4:**23-30.

88.   Marston C, Renedo A, McGowan CR, Portela A: **Effects of Community Participation on Improving Uptake of Skilled Care for Maternal and Newborn Health: A Systematic Review.** *PLoS One* 2013, **8:**e55012.

89.   English M, Irimu G, Wamae A, Were F, Wasunna A, Fegan G, Peshu N: **Health systems research in a low-income country: easier said than done.** *Arch Dis Child* 2008, **93:**540-544.

90.   General Statistic Office of Vietnam: *Statistical Yearbook of Vietnam 2015.* Hanoi: Vietnam Statistical Publishing House; 2015.

91.   Nga NT, Malqvist M, Eriksson L, Hoa DP, Johansson A, Wallin L, Persson LA, Ewald U: **Perinatal services and outcomes in Quang Ninh province, Vietnam.** *Acta Paediatr* 2010, **99:**1478-1483.

92.   Wallin L, Malqvist M, Nga NT, Eriksson L, Persson LA, Hoa DP, Huy TQ, Duc DM, Ewald U: **Implementing knowledge into practice for improved neonatal survival; a cluster-randomised, community-based trial in Quang Ninh province, Vietnam.** *BMC Health Serv Res* 2011, **11:**239.

93.   Persson LÅ, Nga NT, Målqvist M, Thi Phuong Hoa D, Eriksson L, Wallin L, Selling K, Huy TQ, Duc DM, Tiep TV, et al: **Effect of Facilitation of Local Maternal-and-Newborn Stakeholder Groups on Neonatal Mortality: Cluster-Randomized Controlled Trial.** *PLoS Med* 2013, **10:**e1001445.

94.   American Educational Research Association, American Psychological Association, National Council on Measurement in Education: *Standards for educational and psychological testing.* 4th edn. Washington, DC: American Educational Research Association; 1999.

95.   Eriksson L, Duc D, Eldh A, Thanh VP, Huy T, Malqvist M, Wallin L: **Lessons learned from stakeholders in a facilitation intervention targeting neonatal health in Quang Ninh province, Vietnam.** *BMC Pregnancy Childbirth* 2013, **13:**234.

96.   Elo S, Kyngas H: **The qualitative content analysis process.** *J Adv Nurs* 2008, **62:**107-115.

97.   Polit DF, Beck CT, Owen SV: **Is the CVI an acceptable indicator of content validity? Appraisal and recommendations.** *Res Nurs Health* 2007, **30:**459-467.

98.   Conrad F, Blair J: **From impressions to data: Increasing the objectivity of cognitive interviewing.** In *Proceedings of the Section on Survey Research Methods, Annual Meetings of the American Statistical Association*; 1996.

99.   Brislin RW: **Back-Translation for Cross-Cultural Research.** *J Cross Cult Psychol* 1970, **1:**185-216.

100.   Yu DS, Lee DT, Woo J: **Issues and challenges of instrument translation.** *West J Nurs Res* 2004, **26:**307-320.

101.   Brown TA: *Confirmatory Factor Analysis for Applied Research.* 2nd edn. Guilford Publications; 2015.

102.   Duc DM, Bergström A, Eriksson L, Selling K, Ha BTT, Wallin L: **Response process and test–retest reliability of the Context Assessment for Community Health tool in Vietnam.** *Glob Health Action* 2016, **9**.

103.   DeVon HA, Block ME, Moyle-Wright P, Ernst DM, Hayden SJ, Lazzara DJ, Savoy SM, Kostas-Polston E: **A psychometric toolbox for testing validity and reliability.** *J Nurs Scholarsh* 2007, **39:**155-164.

104. Dieleman M, Gerretsen B, van der Wilt GJ: **Human resource management interventions to improve health workers' performance in low and middle income countries: a realist review.** *Health Res Policy Syst* 2009, **7:**7.

105. Lambrou P, Kontodimopoulos N, Niakas D: **Motivation and job satisfaction among medical and nursing staff in a Cyprus public general hospital.** *Hum Resour Health* 2010, **8:**26-26.

106. Elsabbagh M, Yusuf A, Prasanna S, Shikako-Thomas K, Ruff CA, Fehlings MG: **Community engagement and knowledge translation: progress and challenge in autism research.** *Autism* 2014, **18:**771-781.

107. Lewis M: **Informal payments and the financing of health care in developing and transition countries.** *Health Aff (Millwood)* 2007, **26:**984-997.

108. Taryn Vian, Derick W. Brinkerhoff, Frank G. Feeley, Matthieu Salomon, Nguyen Thi Kieu Vien: **Confronting Corruption in the Health Sector in Vietnam: Patterns and Prospects.** Boston: Boston University; 2011.

109. Research and Training Centre for Community Development, Boston University School of Public Health: *Towards a transparent and quality healthcare system: A qualitative study on the causes, perceptions, and impact of informal payments in health services in Vietnam.* Vietnam: Transparency International; 2011.

110. Dunlop K: **Informal payments for healthcare in Bangladesh, Nicaragua, South Africa, Uganda and Vietnam: a comparative analysis of five cross-sectional studies using the Context Assessment for Community Health (COACH) tool.** Uppsala University, 2016.

111. Nguyen HV, Duong HT, Vu TT: **Factors associated with job satisfaction among district hospital health workers in Northern Vietnam: a cross-sectional study.** *Int J Health Plann Manage* 2016.

112. Dieleman M, Cuong PV, Anh LV, Martineau T: **Identifying factors for job motivation of rural health workers in North Viet Nam.** *Hum Resour Health* 2003, **1:**10.

113. Tran BX, Van Hoang M, Nguyen HD: **Factors associated with job satisfaction among commune health workers: implications for human resource policies.** *Glob Health Action* 2013, **6:**1-6.

114. Vietnam Ministry of Health, Health Partnership Group: *Joint Annual Health Review 2009: Human Resources for Health in Vietnam.* Hanoi: Vietnam Medical Publishing House; 2009.

115. Nørlund I, Dinh DN, Sinh BT, Dung C, Quang DN, Diem DB, Cuong NM, Cuong TT, Mai VC: *The Emerging Civil Society: An Initial Assessment of Civil Society in Vietnam.* Hanoi: Vietnam Institute of Development Studies; 2006.

116. Wischermann J: **Civil Society Action and Governance in Vietnam: Selected Findings from an Empirical Survey.** *Journal of Current Chinese Affairs* 2010, **39:**3-40.

117. Björkman M, Svensson J: **Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda.** *Q J Econ 2*009, **124:**735-769.

118. Squires A, Aiken LH, van den Heede K, Sermeus W, Bruyneel L, Lindqvist R, Schoonhoven L, Stromseng I, Busse R, Brzostek T, et al: **A systematic survey instrument translation process for multi-country, comparative health workforce studies.** *Int J Nurs Stud* 2013, **50:**264-273.

119. Drennan J: **Cognitive interviewing: verbal data in the design and pretesting of questionnaires.** *J Adv Nurs* 2003, **42:**57-63.

120. Stepurko T, Pavlova M, Gryga I, Groot W: **Empirical studies on informal patient payments for health care services: a systematic and critical review of research methods and instruments.** *BMC Health Serv Res* 2010, **10:**273.

121. Bernardi RA, Delorey EL, LaCross CC, Waite RA: **Evidence of social desirability response bias in ethics research: An international study.** *Journal of Applied Business Research (JABR)* 2011, **19**.

122. Fu W, Deshpande SP, Zhao X: **The Impact of Ethical Behavior and Facets of Job Satisfaction on Organizational Commitment of Chinese Employees.** *J Bus Ethics* 2011, **104:**537-543.

123. Nolte S, Elsworth GR, Osborne RH: **Absence of social desirability bias in the evaluation of chronic disease self-management interventions.** *Health Qual Life Outcomes* 2013, **11:**114-114.

124. Tourangeau R, Smith TW: **Asking sensitive questions: The impact of data collection mode, question format, and question context.** *Public Opin Q* 1996, **60:**275-304.

125. Couper MP, Singer E, Tourangeau R: **Understanding the Effects of Audio-CASI on Self-Reports of Sensitive Behavior.** *Public Opin Q* 2003, **67:**385-395.

126. Rasinski KA, Visser PS, Zagatsky M, Rickett EM: **Using implicit goal priming to improve the quality of self-report data.** *J Exp Soc Psychol* 2005, **41:**321-327.

127. Mowday RT, Steers RM, Porter LW: **The measurement of organizational commitment.** *J Vocat Behav* 1979, **14:**224-247.

128. Stamatakis KA, McQueen A, Filler C, Boland E, Dreisinger M, Brownson RC, Luke DA: **Measurement properties of a novel survey to assess stages of organizational readiness for evidence-based interventions in community chronic disease prevention settings.** *Implement Sci* 2012, **7:**65.

129. Bahtsevani C, Willman A, Khalaf A, Östman M: **Developing an instrument for evaluating implementation of clinical practice guidelines: a test-retest study.** *J Eval Clin Pract* 2008, **14:**839-846.
130. Hallgren KA: **Computing Inter-Rater Reliability for Observational Data: An Overview and Tutorial.** *Tutor Quant Methods Psychol* 2012, **8:**23-34.
131. Hoben M, Estabrooks CA, Squires JE, Behrens J: **Factor Structure, Reliability and Measurement Invariance of the Alberta Context Tool and the Conceptual Research Utilization Scale, for German Residential Long Term Care.** *Front Psychol* 2016, **7:**1339.
132. Jack SM: **Utility of qualitative research findings in evidence-based public health practice.** *Public Health Nurs* 2006, **23:**277-283.
133. Sandelowski M: **Using qualitative research.** *Qual Health Res* 2004, **14:**1366-1386.
134. Pawson R, Tilley N: *Realist Evaluation.* London: Sage; 1997.
135. Shrout PE, Fleiss JL: **Intraclass correlations: uses in assessing rater reliability.** *Psychol Bull* 1979, **86:**420-428.
136. Cohen J: **A Coefficient of Agreement for Nominal Scales.** *Educ Psychol Meas* 1960, **20:**37-46.
137. Berk RA: **Generalizability of behavioral observations: a clarification of interobserver agreement and interobserver reliability.** *Am J Ment Defic* 1979, **83:**460-472.
138. Streiner DL, Norman GR: *Health Measurement Scales: A practical guide to their development and use.* 5th edn. Oxford: Oxford University Press; 2015.
139. Waltz CF, Strickland OL, Lenz ER: *Measurement in Nursing and Health Research.* 4th edn. New York: Springer Publishing Company; 2010.

Acta Universitatis Upsaliensis

Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine 1297

Editor: The Dean of the Faculty of Medicine

ACTA
UNIVERSITATIS
UPSALIENSIS
UPPSALA
2017