Professional learning, organisational change and clinical leadership development outcomes

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Abstract

INTRODUCTION
The aim of this study is to develop a conceptually sound outcome model for clinical leadership (CL) development in healthcare, linking individual professional learning and organisational change. Frontline doctors' CL is often offered as a solution to healthcare challenges worldwide. However, there is a paucity of rigorous evidence of effectiveness of CL development, or theories supporting it. Inportantly, the literature currently lacks robust outcome models for CL development, impeding robust impact evaluations.

METHODS
This multi-source, sequential integrated mixed-methods study draws on systematic content analysis of NHS policy documents and empirical data from a CL programme evaluation study: exploratory factor analysis (EFA) of 142 participants' survey responses and thematic qualitative analysis of 30 in-depth participant interviews across six cohorts. Through integrating findings from the three analyses we examine: (a) the expected organisational outcomes of CL, (b) individual learning outcomes of CL development, and (c) the mechanisms linking the two.

RESULTS
The policy analysis identified three desired solutions to key healthcare problems which CL is expected to offer: Speeding up good practice, Inter-professional collaboration and dialogue, and Change and transformation. Triangulating the EFA results with the qualitative analysis produced five individual outcome constructs: Self-efficacy, Engaging stakeholders, Agency, Boundary-crossing expertise, and Willingness to take risks and to learn from risks and failures. Further qualitative analysis uncovered key mechanisms linking the individual outcomes with the desired organisational changes.

DISCUSSION
Despite significant investments into CL development in the UK and worldwide, the absence of conceptually robust and operationally specific outcome models linking individual and organisational impact impedes rigorous evaluations of programme effectiveness. Our study developed a novel individual and organisational outcome model including a theory of change for clinical leadership. Our findings further contribute to professional learning theory in medical settings by conceptualising and operationalising the mechanisms operating between individual and organisational learning outcomes.

1 Introduction: Challenges in researching the effectiveness of clinical leadership development

1.1 Clinical leadership development: The gap in the literature

Healthcare systems worldwide face significant challenges concerning the increasing complexity of clinical problems, and the financing, organisation and quality of health care. *Clinical leadership* has emerged as a central issue in discussions about future healthcare.[1-5] Clinical leadership hereby refers to the leadership of clinicians in the context of their clinical roles (rather than replacing clinical practice with formal management positions).[1] This involves broadening clinicians' existing roles, training and competences. Many countries now have national clinical leadership frameworks for doctors, such as the UK's Medical Leadership Competencies Framework (MLCF)[6], CanMEDS in Canada[7] and the Health LEADS Australia framework[8,9]. In the US, while not an Accreditation Council for Graduate Medical Education (ACGME) requirement, leadership training has been highlighted as key[10] and increasingly incorporated into graduate medical education programmes[11,12] with similar developments taking place across Europe.[13-15] A need for attention to clinical leadership development of doctors has also recently been identified in Latin America[16] and in low and middle income countries of the Global South.[17-19]

The desire for clinical leadership is not paralleled by evidence of the best ways to develop it. As leadership training for frontline medical staff has gained momentum, a burgeoning industry of clinical leadership development programmes has emerged. While evidence suggests that effective clinical leadership can improve patient outcomes and experience [11,20-25] there is a paucity of rigorous evidence of the effectiveness of these programmes. Recent international reviews note that even where evaluations exist, designs and methods are often weak.[1,2,4,14,15,26-30] Randomised controlled trials are rare. Even in the US, where clinical leadership development is widely established[12] there is a lack of evidence-based best-practice models for clinical leadership development.[27] The limited

experimental evidence of clinical leadership development suggests a general positive effect,[13,31] supported by a meta-analysis of experimental studies outside healthcare.[32] However, studies commonly only evaluate immediate individual impact, with little attention to organisational benefits.[4,12,13,29,32,33]

Rosenman et al.[27] conclude that "[d]etermining best practices in leadership training is confounded by variability in leadership definitions, absence of supporting frameworks, and a paucity of robust assessments." The difficulty in experimentally evaluating the broader impact of complex professional development interventions notwithstanding, evaluating clinical leadership development faces a more fundamental challenge: what is 'clinical leadership' as the desired outcome? In their experimental study of clinical leadership development, Lornudd and colleagues[34] highlighted the absence of adequate *outcome measures* to evaluate the impact of clinical leadership professional development. A recent review of instruments to assess clinical leadership development supports this observation.[35] The absence of appropriate measures reflects a wider lack of conceptual clarity about what clinical leadership means, identified in a number of reviews[1,2,27,28] as impeding rigorous cumulative empirical research. To develop conceptual clarity and robust constructs of clinical leadership, systematic reviews have called for a range of methods, including in-depth studies.[1,2,28]

Our study addresses the gap in the literature about the lack of conceptual outcome models for clinical leadership development, involving attention to the mechanisms of professional learning and change. This is a theoretically informed, multi-methods study seeking to conceptualise and operationalise clinical leadership in ways that will enable us to identify and evaluate its development at scale. To do this, we develop a conceptual framework drawing on a range of evidence. We review existing models and theories of clinical leadership, as well as a range of evaluations, empirical studies and systematic reviews of clinical leadership development to establish what is known about its effectiveness and outcomes, and to identify patterns and gaps in evidence. We then present an

original content analysis of selected UK clinical leadership policy documents to identify desired outcomes for clinical leadership development. Finally, we present the empirical findings from a systematic, mixed-methods evaluation of a clinical leadership development programme (one of the first of its kind[36]) to analyse its outcomes in practice. Based on an analytical synthesis of these, we develop a conceptual and operational model of clinical leadership, and the mechanisms by which it may be linked with desired organisational outcomes.

1.2 Clinical leadership models and theories

Various clinical leadership models and frameworks exist, such as the Medical Leadership Competency Framework (MLCF)[6] in the UK, and the Canadian Medical Education Directives for Specialists (CanMEDS).[37] Such frameworks are valuable as a feedback framework for leadership education and professional development.[38,39] However, the conceptual ambiguity of such models limits their usefulness as research tools.[39,40] Moreover, while describing competences/actions clinical leaders should have/take, these frameworks are often not operationally specific, nor do they describe the *mechanisms* by which certain non-clinical competences might link with improved organisational outcomes.

Clinical leadership theories can also lack operational specificity. Clinical leadership literature discusses transformational,[3,4,41,42] authentic,[4,42] shared;[3,4,43] distributed,[3,42,44] and collaborative or collective leadership,[45,46] all highlighting the need to look beyond the individual. Like leadership models, such notions can be helpful for workplace discussions. However, much of the literature on these concepts consists of reports and discussion papers, with few systematic empirical studies, whereas many leadership development programmes do not incorporate such theories.[1,2,27] Gronn[47] has described such theories as ways of characterising the leadership of an organisation rather than as models. To evaluate clinical leadership development, we need a conceptually integrated model that links competences and behaviours with organisational outcomes, and has operational specificity

that enables empirical studies. Next, we review empirical studies of clinical leadership to identify patterns that might inform such a model.

1.3 Evaluations of clinical leadership development

Our review of evidence found that many studies that go beyond participant satisfaction find perceived positive impacts on participating doctors' (i) leadership and management knowledge and attitudes, as well as their (ii) capacity to (net)work with, and (iii) lead others. The evidence further suggests that these three areas may be relevant to organisational improvement. Exploratory research links clinicians' attitudes and commitment to, and knowledge of, organisational improvement with performance, while correlational research suggests a link from effective collaboration to clinical outcomes. **Table 1** details the identified evidence in these areas.

Table 1 Synthesis of findings from empirical studies on clinical leadership development

Outcome	Evidence of impact of clinical leadership development on individual learning outcomes	Evidence of link to organisational improvements
Knowledge about and attitudes towards organisational issues	Clinical leadership development found to improve: - Participants' **k**nowledge and understanding of how healthcare works (incl. finances)[2,28,29,31,36,48-51]; - Participants' sense of empowerment in their jobs and a mindshift in the way the participants viewed their role in service improvement[2,28,29,36,49-53]; - participants' self-confidence as leaders[14,28,29,31]	Knowledge of finances and how the organisation works essential for clinical leadership in order to offer clinical care effectively within existing resources[24,54] Clinicians' motivation and commitment towards making an active contribution to organisational improvement within their clinical roles linked with organisational performance in exploratory research[55-57]
Capacity to lead others	Clinical leadership development found to improve: - Participants' capacity for working with and leading others[2,13,28,31,36,48-52,58] - And their capacity to raise issues effectively[2,28,48,52,58]	Leadership styles oriented towards relationships with others effective on clinical outcomes[59]
Capacity to network with others	Clinical leadership development found to improve: - Participants' capacity to engage stakeholders[2,28,36,49,50,53]	Reducing resistance among clinicians to engaging with management important for effective collaboration[60]; Collaboration expertise found to be domain-specific[61] suggesting developing cross-domain collaboration competences may support organisational outcomes

Our synthesis of the evidence further suggests that these are relevant areas for clinical leadership development. Even when relevant organisational knowledge, and opportunities for developing competences of working with others are made available to clinicians, the evidence shows that they are not always willing to engage with leadership and management perspectives.[60] It also shows that clinicians find working beyond the boundaries of existing – clinical – roles and identities (sometimes referred to as 'silos' or 'tribes'), and collaborating laterally across inter-professional boundaries challenging.[11,24,54,62] Professional development is needed to support these. We need to better understand the nature of beneficial knowledge/competences, and the mechanisms through which these understandings/competences are linked with organisational outcomes.

1.4 Research on professional and organisational learning and change in complex practices

Our evidence synthesis found that gaining organisational knowledge may not motivate clinicians to engage with organisational issues. Research investigating the conditions of successful professional and organisational change offers further insights into such mechanisms. Professional learning research from educational as well as clinical settings suggests that self-efficacy – professionals' belief in their ability to effectively handle challenges related to leadership, including self-motivational beliefs – is a key dimension,[63,64] with greater professionals' self-efficacy enabling greater commitment and perseverance.[65] This links with agency – participants' "possibility and willingness to impact (and eventually transform) the activity in the realisation of which they are engaged".[66] Research has found that when facing challenges, professionals often define themselves as un-agentic in their professional activities, framing leading change in their practice as out-of-reach.[67] These concepts help explain why participants' organisations do not automatically benefit from clinical leadership development.

Furthermore, research shows that effective collaboration across professional boundaries requires a capacity for working across those boundaries[68]. New knowledge needs to be analysed and adapted by clinicians.[69-71] More than just appropriation of other professional groups' (such as management) knowledge/competences, professionals need to come to understand, and work productively with the perspectives/motives of others, to develop a common knowledge.[72] Research on clinical leadership suggests developing such common knowledge requires purposeful effort: when clinicians and non-clinical managers worked together without an appreciation of each other's knowledge and shared goals, the gulfs between their perspectives and priorities would intensify rather than decrease.[24] Finally, transformation is risky which does not sit easily with risk-averse, high-accountability healthcare systems.[73]

To conclude, overcoming resistance to engagement in leadership/management and difficulties of inter-professional collaboration may require a focus on clinicians' self-efficacy and sense of agency, engaging with and understanding the perspectives and motives of others, and addressing risk.

1.5 Research Questions

To address the gap in the literature identified in paragraph 1.1 on the lack of conceptual outcome models for clinical leadership development linking to professional learning and organisational change, our study asks the following questions:

RQ1: What should 'clinical leadership' achieve in a healthcare system like the NHS?

RQ2: How can we depict and conceptualise the professional learning outcomes of clinical leadership development?

RQ3: How are the individual clinical leadership development outcomes linked with the desired organisational outcomes?

We address RQ1 through an analysis of policy documents related to clinical leadership from the UK, and RQ2–3 through a sequential-iterative, mixed-methods study of a clinical leadership development programme, namely, the Chief Residents' Clinical Leadership and Management programme (now: CR). The Faculty of Education at Cambridge University ethically approved the study.

2 Methods

2.1 Data, participants and setting

Policy documents. Five recent key policy documents relating to clinical leadership in the UK National Health System (NHS) were analysed, all of which state that clinical leadership of frontline staff is needed to address current healthcare challenges:

- The Darzi report, High Quality Care for All: NHS Next Stage Review Final Report (2008)[5]

- The Francis Review, Report of the Mid Staffordshire NHS Foundation Trust public inquiry: executive summary (2013)[74]

- The Five Year Forward Review by NHS England (2014)[75]

- The Rose Review, Better leadership for tomorrow: NHS leadership review (2015)[76]

- The Future of the NHS Leadership review commissioned by the HSJ (2015).[77]

The documents were selected purposefully, as the national policy reviews which are widely cited both within the healthcare system and in research, and thereby can be considered influential for current discussions and developments in the UK. While the reviews all relate to the UK, the literature review suggested parallels with policy developments in other countries.

The Chief Residents Clinical Leadership and Management programme (CR), initiated at Cambridge University Hospitals NHS Foundation Trust (Addenbrooke's) in 2010, targets early career doctors

(senior trainees/specialist registrars and GPs). The programme aims to develop future clinical leaders of healthcare delivery, who are able to address leadership and management challenges and initiate and lead improvement initiatives in their clinical settings. It recruits 40–50 participants each year from the East of England, and is sponsored by the NHS through its local education and training board: Health Education East of England (HEEoE). The 10-month programme has three main components:

- 10 taught modules (1 full day/month) delivered by the faculty of the Cambridge University Judge Business School, covering an abbreviated and tailored version of an MBA curriculum focusing on a range of healthcare and non-healthcare organisations, as well as a leadership simulation exercise.

- A 10-month service improvement project in the participants' departments.

- A Chief Resident role in the participants' departments, intended to facilitate communication between trainees and consultants.

While our study is based on the analysis of one clinical leadership programme, it gains further strength from the fact that it includes the participants of seven annual cohorts of programme participants, a rare approach in the field.[36] Six cohorts, a total of 231 people had completed the programme in 2016–17 when the interview data was collected. The seventh cohort were completing the programme by 2017 when the survey data was collected, bringing the total to 293 people. The programme therefore offers an excellent opportunity to investigate the impacts of such programmes.

Interviews. We conducted 30 qualitative, in-depth interviews with participants from across six cohorts (N=231, 13%) who had completed the Chief Residents' programme, selected through a stratified sampling procedure (cohort/organisation) to ensure a range of views and experiences. The interviews (mean duration 30 min) were conducted in person or via phone/Skype by the first author,

audio recorded and transcribed verbatim. The interviews followed a schedule developed by the authors, based on the literature, exploring participants' perceptions and thinking regarding:

- The benefits of taking part in the programme,

- Service improvement during and after the programme: Benefits and challenges,

- Challenges faced in practice and whether/how the programme facilitated these (clinical practice, team leadership, collaboration with management, service improvement),

- Opportunities and barriers to clinical leadership and service improvement,

- Ideas for programme improvement.

Several systematic steps were taken to improve the validity of the interview data and counteract common forms of bias, such as social desirability: Interviewees were explicitly probed for negative perspectives or perceptions of no impact from the programme in order to avoid leading questions. In order to legitimate sharing negative views, participants were also informed that not all participants of such programmes find leadership feasible for clinicians. The interviews followed a principle informed by earlier research, whereby participants were probed for concrete examples of practice to substantiate their comments.[78]

Survey. A detailed questionnaire was developed, based on the literature and preliminary analysis of the interviews, containing statements with a 5-point Likert scale and open responses, piloted through an expert panel and revised for comprehension and face validity. We invited all participants from seven cohorts (N=293) of the programme to complete an online survey. The response rate was high (N=159, 54%). We analysed the response rate across the various participant dimensions: the different cohorts of programme participants, types of organisations (large University hospital, regional hospital, General Practice) and professional groups, and found the response rate consistent across all dimensions. The responses came from participants in 35 different medical specialties from 20 NHS Trusts and several GP practices. Over 1/3 of participants from every cohort, starting from 2010, responded, and at least half of participants from every organisation type did so. This increases

the confidence that the data is representative of the group as a whole and there is no response bias.

In addition, the findings from the analyses were presented to the subsequent programme cohort the

year after our study who found they resonated with their experience.

2.2 Data analysis

The policy documents underwent a systematic analysis of thematic content[79] by the first author:

1. Segments in each document discussing challenges suggested as key to the NHS by those

    documents were identified.

2. Each segment's challenge was coded according to the theme it described.

3. The segments with the same identified theme were grouped together and compared, and

    where necessary themes were amended and segments re-coded.

4. Detailed text within each theme category was then reviewed to ensure that they still

    matched the overall category, and to identify and distinguish:

    a. What the discussed challenge was

    b. What the consequences of the challenge were for the NHS

    c. How clinical leadership was seen in these policy documents to address those

        consequences (b), and, indirectly, those challenges (a)

5. Findings across the thematic categories were compared and a synthesised model of the key

    idea was constructed.

6. The findings were discussed with a group of experts (senior clinicians and other

    professionals involved in leading and designing clinical leadership development in

    Cambridge and the East of England).

Interview data and open survey responses were cross-sectionally coded by the first author for

themes from the interview schedule, as well as emergent issues raised by participants.[80,81]

Discrepant cases for each theme were systematically sought and compared.[73,82] Deeper conceptual

insights were developed through analysing nuanced differences within each theme (such as 'engaging stakeholders'), which resulted in new findings, such as the model for engaging stakeholders discussed below (see also[73]). Further substantiating evidence was sought through examining concrete examples of practice.[78] NVivo11 software was used to assist the analysis. To support the validity of the coding, the first round of coding was scrutinised with the research assistant who assisted in the data collection and management and was very familiar with the interview data and trained with qualitative coding. The data was then re-coded by the first author. In this second round of coding, the themes were probed by repeatedly discussing them and the supporting data with the second author. Further validation of the interview analysis was offered by three additional key strategies: (i) by word and coding queries in NVivo11 which enabled the authors to check for any missed insights and (ii) by triangulating the interview findings with findings from the survey analysis, besides (iii) discussion of the findings with the programme team and its current cohort provided participant validation.

Descriptive statistics were developed for all of the survey data[67]. The study at-hand draws particularly on the data on participants' resulting knowledge and thinking (Items Q33(1-3), Q35(1-4), Q36(1-12) and Q37(1-11), see Table 2). To understand the underlying constructs, factor analysis was conducted to identify clusters of related variables, using IBM-SPSS23. Since no ready conceptual construct existed in the literature for clinical leadership, exploratory factor analysis was chosen. Several indicators were used to determine the number of factors: Scree plot, eigenvalues, the total variance explained and whether the resulting item clusters presented conceptually meaningful aspects of clinical leadership.[83] This resulted in a multi-factorial model which was then compared again with the analysis of the interview data.

3 Results

3.1 Policy Analysis

The document analysis produced a fairly consistent picture of the current landscape in the UK.

Figure 1 presents the findings of the policy document analysis. It shows that the key challenges

involve increasing and changing demand, particularly in terms of an aging population and increasing

multi-morbidities; negative cultures within healthcare, including a tolerance of poor care

demonstrated in repeated care crises; and challenges brought on by repeated re-organisations of

practice over the last decade. The analysis shows that the consequences of these challenges entail

increasing costs, complex care needs, care quality issues, staff wariness and absence of genuine

change. Across the documents, the following are seen as necessary solutions: increasing inter-

professional collaboration, speeding up the scaling up of good practice and genuine change and

transformation of practice, instead of further organisational re-structuring.

Figure 1 Results of the policy analysis on the assumed relationship of clinical leadership to healthcare challenges

3.2 Exploratory factor analysis of the survey

The exploratory factor analysis (EFA) of the survey results suggests five conceptually relevant underlying constructs in the outcomes of the clinical leadership development course. **Table 2** presents the findings of the EFA.

The factorial structure of the participants' achieved knowledge and thinking was initially investigated on the basis of 30 items. The correlation matrix showed that all but one item correlated at least .3 with at least one other item, suggesting reasonable factorability. This item was removed from further analysis (Q37_8). Communalities were inspected and one item was removed due to low communality (<.3) (Q37_9). The Kaiser-Meyer-Olkin MSA (Measure of Sampling Adequacy) showed that partial correlations among variables were likely to be large (MSA = .88). Bartlett's test of sphericity was significant (p < 0.001) indicating strong relationships among the variables. We therefore concluded that it was appropriate to perform factor analysis on these 28 items. Maximum Likelihood extraction was used, with Varimax and Oblimin rotations. Missing data were excluded using listwise deletion of missing values. This meant that 17 cases were removed from the analyses since they had one or more missing values on the items. The analyses were done on the data of the 142 participants who had answered all questions in the survey.

Parallel analysis suggested six factors to be extracted. However, regardless of the rotation method used, a 6-factor model resulted in double loadings of items, with no conceptual clarity. The Scree plot could also be interpreted as suggesting a 1-factor solution. The first six eigenvalues of the scree plot (using parallel analysis) were: 9.89, 1.70, 0.97, 0.81, 0.68, and 0.51. The 1-factor model produced a simple structure however, capturing only 35.2% of variance. Moreover, the medical education literature has questioned the practice merits of one-dimensional models since they allow

for no conceptual differentiation of the phenomenon, and hence no support for educational

improvement.[83]

Solutions for three, four, five and six factors were examined using Varimax and Oblimin rotations of

the factor-loading matrix. Both authors independently reviewed the remaining factor models for

relevant solutions and their conceptual interpretations. We considered both internal conceptual

consistency of the items in each factor, and the factor's resonance with the literature. The 5-factor

solution was preferred. The five extracted factors together explain 55% of the variance in

participants' current knowledge and thinking, using Varimax. The proportions of variance explained

by each of the rotated factors showed that all five make a contribution (17.3%, 13.3%, 10.1%, 8.2%,

6.2% respectively). Importantly, the 5-factor model suggests a conceptually relevant structure.

All items in the 5-factor model have primary loadings of .4 or over. Due to the high inter-correlations

of the items in the dataset, several items had cross-loadings of >.3. Since only two items had a cross-

loading of >.4, we however accepted this due to their conceptual relevance and support by the

interview data. Finally, one factor (Risk-taking) only contains two items, as this topic only contained

two questions in the questionnaire. We accept this factor with just these two items because (i) of its

theoretical importance and distinctness and (ii) as the inter-correlation of the items is reasonable

(.761** (Spearman-Brown Coefficient .864)).[84]

Table 2. Factor loadings

Items	Knowledge/ Understanding and Mindset	Capability to engage stakeholders	Willingness and capability for boundary-crossing	Effecting change	Willingness to take risks to effect change
Q35_1: I feel positive about the leadership responsibilities as a consultant/GP.	0.76				
Q35_3: I want to influence decision-making in my organisation	0.75				
Q35_2: I am keen to integrate a management role in my (future) consultant/GP post	0.75				
Q33_3: I understand the primary-secondary interface well.	0.54				
Q35_4: I feel I can successfully manage the stressful aspects of my work.	0.51				
Q33_2: I understand the financial side of clinical practice in my organisation.	0.50				
Q33_1: I understand how the management of the department influences what we do as clinicians.	0.49				
Q36_1: I know whom I need to engage in my service improvement projects in order to get buy-in.		0.79			
Q36_2: I know whom I can ask for information in my organisation to support my service improvement projects.		0.73			
Q36_3: I have successfully involved stakeholders to get their buy-in.		0.58			
Q36_4: I have successfully persuaded colleagues to change our practice.		0.51			
Q36_9: I discuss our service provision with colleagues from my department.			0.73		
Q37_3: I think of what could be changed in our overall service provision in my department.			0.73		
Q37_2: If I notice problems in our service, I express them.			0.68		
Q36_8: I have taken concrete steps to enable a collaborative culture in my clinical team.			0.60		
Q36_10: I discuss my team's performance with colleagues from other teams.			0.55		
Q37_4: I am confident to voice ideas in my organisation beyond my immediate clinical team.			0.54	0.40	
Q36_11: I have conversations with the non-clinical management of my organisation.			0.53		
Q36_12: I actively support colleagues or trainees to undertake service improvement.			0.53		
Q36_7: In my current organisation, I feel I am on the same side as the non-clinical managers.			0.50		
Q37_1: I have a clear understanding of the quality of the overall service in my organisation.			0.45		
Q36_6: I have colleagues in different departments to call on if I have a question.			0.44		
Q36_5: I successfully conduct difficult conversations in my clinical team.			0.40		
Q37_7: I can effect change in my current organisation.				0.84	
Q37_6: I influence decision-making in my organisation.				0.84	
Q37_5: I have changed the service in my department to improve the quality of patient care.			0.44	0.59	
Q37_11: I am willing to take personal risks to achieve change in my clinical practice.					0.93
Q37_10: I am willing to take reputational risks to achieve change in my clinical practice.					0.69

We initially named the five resulting constructs as follows:

- Knowledge/Understanding and Mindset

- Capability to engage stakeholders

- Willingness and capability for working across boundaries

- Effecting change

- Willingness to take risks to effect change

The review of the literature and the interview analysis together with these factors further refined our conceptual definitions. Two dimensions of analysis of the interview data are discussed: an investigation of (i) the extent and ways in which the interview data supports and further develops the outcome constructs from the factor analysis and (ii) evidence about the mechanisms by which these constructs may be linked with the desired organisational outcomes.

3.3 Analysis of interviews: Outcome constructs

The interviews supported and expanded the understanding of the outcome constructs suggested by the survey. **Table 3** includes brief illustrative data examples.

Knowledge/Understanding and Mindset. The interviews further support the importance of knowledge about how health organisations work as part of leadership development outcomes. Expanding this through the interview data, we suggest this is about what professional learning literature calls *self-efficacy*: professionals' belief in their ability to effectively handle challenges related to leadership, including self-motivational beliefs [48, 49]

Table 3 Individual professional learning in clinical leadership development: Outcome constructs proposed by the mixed-methods analysis

Survey construct	Factor contained	Linked findings from interviews	Outcome construct
Knowledge/ Understanding and Mindset	An understanding of how the organisation works; positive about, and wanting to contribute to, this area of work	- Participants 'would not have learned about NHS issues in-depth without the leadership programme' as they are 'not part of medical training' - They 'were never encouraged to look into those issues' and 'would not have cared' - 'Lot of doctors see management as a burden' while after leadership development, participants 'see it as exciting' and as something 'possible to resolve'	Self-efficacy
Capability to engage stakeholders	Knowing whom to engage to support change and being able to do so successfully.	The participants' capability to lead and persuade others (the '**How**') improved. However, a more complex picture of engaging others emerged. We suggest this relates to the following dimensions of engaging stakeholders: **The Who**: Understanding who 'is important', who 'needs to be involved and who doesn't' , and differentiating between 'sources of help' and people 'likely to be obstructive' **The When**: Involving people 'who feel they should be involved' and those who 'will champion you' early enough to avoid resistance and get support while 'informing others at selected points' to avoid over-crowding projects **The What**: Involving people with 'different perspectives' and 'information' to offer 'different ways of looking at problems and developing strategies to deal with them' **The Why**: Learning to differentiate different reasons for involving people, from avoiding resistance to gaining champions to getting information	Engaging stakeholders
Willingness and capability for boundary-crossing	Confidently expressing own viewpoints; supporting collaborative cultures; cross-dept networks; feeling on the same side with non-clinical management	- 'Having the confidence to argue your point with potentially much more senior people than yourself' - Confidence that you 'can talk to and work with people from different professional groups' - And moreover: 'facilitating cross-group communication', being a 'bridge' between different groups	Boundary-crossing expertise
Effecting change	The ability to influence decision-making and effect change in one's organisation	Participants report: - 'feeling empowered to change things they are unhappy with'; 'feeling like they have agency' - 'This course isn't necessarily giving people that power, it's just showing them that they do have it.'	Agency
Willingness to take risks to effect change	The willingness to take personal and reputational risks to achieve change in clinical practice	- Learning to differentiate between personal/reputational vs patient safety risk: 'When people become involved in leadership they can take it very personally' even though they are 'resilient around clinical risk' - Opportunity to (practice) take/taking risk resulted in becoming 'a lot less risk averse. Not to the point of being dangerous but not necessarily being afraid of that' - 'Unexpected learning outcome that you can learn from a project which failed'	Willingness to take risks and to learn from risks and failures

Capacity to engage stakeholders. The interviews expand the understanding of clinical leaders'

developing capability to engage stakeholders. Beyond the *How* of engaging and leading others, a

more complex picture of engaging others in leadership emerged from our analysis. It suggests

effective engagement of others involves the *Who* (sources of knowledge/support/resistance, or

people to be simply informed), *When* (at the beginning or just-on-time), *What* (others'

expertise/ideas) and *Why* (gaining support, obtaining information, avoiding resistance, avoiding

over-crowding). As this suggests an expanded view of the same underlying phenomenon, we retain

the name 'Engaging stakeholders' for the dimension.

Willingness and capability for working across boundaries. The interviews support the conceptual

understanding from the survey highlighting confidence to express one's own viewpoints with more

senior colleagues and other professional groups. This is distinct from engaging stakeholders: it is not

only about drawing on others' support and expertise for one's own goals, but also about working

across boundaries on, and expanding, shared goals. Drawing on the literature we call this *boundary-

crossing expertise*.

Effecting change. The interviews support the centrality of professionals' ability to influence decision-

making and effect change in their organisations for clinical leadership development. They further

suggest this is not about 'giving people power but showing them that they do have it', leading to

empowerment. We suggest this resonates with what the literature calls *agency*.

Willingness to take risks to effect change. The interviews expand the understanding of participants'

increasing willingness to take personal/reputational risks to achieve change in clinical practice: Our

interview analysis offers further detail, suggesting that this involves learning to differentiate

between personal/reputational risk and patient-safety risk, the opportunity to (practise) taking

personal/reputational risks and learning that/how you learn from failures. We call this outcome

willingness to take risks and to learn from risks and failures.

3.4 Mechanisms: Links to organisational outcomes

The final question is if, and how, these outcome constructs are linked with the desired organisational outcomes suggested by the policy analysis. **Figure 2** illustrates the mechanisms that link the clinical leadership development outcome constructs with the desired organisational outcomes identified in the policy documents.

Change and transformation. Our analysis supports the suggestion from professional self-efficacy research that the greater professionals' self-efficacy, the greater their commitment and perseverance, thereby potentially facilitating change and transformation in organisations. The analysis shows that participants "feel empowered by the knowledge I gained in change management and have put this to good use as a consultant" (Surv19_Yr2010-2011), while "broadening of clinicians' horizons at the critical juncture at the start of their consultant career is invaluable in establishing a culture of clinical leadership" (Surv15_Yr2013-2014).

Clinicians' enhanced agency also facilitates change and transformation in organisations, as does their enhanced ability to effectively engage stakeholders and willingness to take personal/reputational risks to effect change. The interviews suggest that "if you feel like you have agency in the world then you usually feel more positive about it" (Int16_Yr2011-12). They further suggest that "doctors sometimes feel very disillusioned about management processes because often they feel excluded from those and disempowered, and probably partly because of the course I feel completely the opposite — I feel quite empowered in changing things that I'm unhappy with and I think that's from a longevity in your job point of view quite important, if you feel like you have agency"

(Int15_Yr2010-11). Importantly, as discussed, the course is not about "giving people power" but "showing them that they have it" (Int16_Yr2011-12).

Secondly, the analysis suggests that learning to engage stakeholders supports change and transformation through 'unlocking' new solutions (Int24_Yr2012-13) and wider buy-in and commitment to change. Understanding others' perspectives helped facilitate understanding of problems, and gaining insights into "**Different ways of looking at a situation and developing strategies for dealing with problems and implementing changes**" (Surv93_Yr2014-2015). Interestingly, the participants repeatedly describe learning this as a 'surprise'.

Willingness to take personal/reputational risks is central to change and transformation. Participants describe how "the programme gave me the confidence you are not really going to achieve significant or substantial change without a degree of risk" (Int17_Yr2011-12). Besides, learning that how you learn from failures – another dimension of this outcome – supports risk-taking to achieve change through fostering clinicians' resilience with risk-taking and coping with failures regarding personal/reputational risk. Participants describe how "you've got to be quite resilient" to engage in clinical leadership, continuing that "some doctors really struggle with that, we are quite resilient around clinical issues because we are trained to detach from it, but when people get involved in the leadership and management they can take it really personally" (Int24_Yr2012-13).

Inter-professional collaboration. Alongside new solutions to existing problems in one's own area of work, boundary-crossing enables genuine inter-professional collaboration through involving dialogue across silos. Clinicians often didn't "know management existed" or "wouldn't be usually in contact with … it was more of a 'them and us' scenario" (Int14_Yr2015-16), with management talked about as "the dark side" (Int24_Yr2012-13). Working cross-boundaries on the course "gave us a better background, so we were able to sort of talk in the same language and were coming from the

same place" (Int14_Yr2015-16). Overcoming such "isolationism" is described as "under-played … if not the most crucial aspect of the programme" (Surv88_Yr2013-2014).

Speeding up good practice. Finally, there is evidence that these outcomes are linked with speeding up the scaling up of good practice. We identified two key mechanisms. Firstly, we identified a type of organisational impact we have called the *Whither* of other people. Participants used their learning from the leadership development course to support others to engage in service improvement, suggesting "it is the spread of knowledge laterally to colleagues that can make a lasting benefit" (Int28_Yr2014-15). Secondly, having had the opportunity to practise taking risks "in a safe way, where the reputational risk was not there" (Int02_Yr2014-15) not only meant that participants "did not make the same mistake with the things I've done as a consultant" (Int15_Yr2010-11); "it gives you confidence to do stuff, and it would have taken a lot longer to develop that confidence to do it" (Int24_Yr2012-13). They "would have done [service improvement] eventually but [the programme] gave the confidence to get on with it so soon" (Int19_Yr2014-15); instead of "lying low for a while" the programme "accelerates what you are prepared to take on as a junior consultant" (Int15_Yr2010-11).
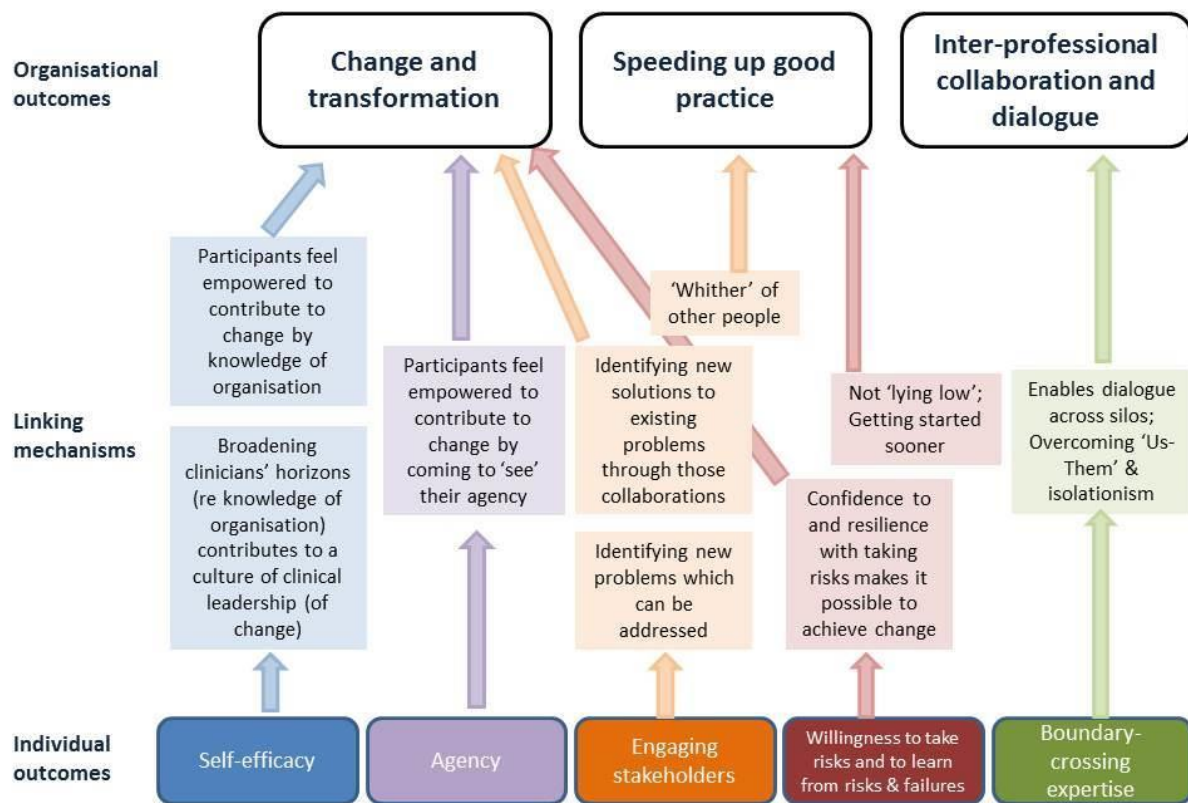
Figure 2 Conceptual model of the individual and organisational outcomes from clinical leadership development and the mechanisms linking those

4 Discussion

There are huge challenges in healthcare systems worldwide to which clinical leadership has been seen to offer an answer.[1-5] The significant investments in clinical leadership development notwithstanding, there is a paucity of rigorous evidence of its effectiveness, particularly regarding organisational benefits. [1,2,4,14,15,26-30] The absence of conceptually robust and operationally specific outcome models for clinical leadership development presents an important gap in the literature. Moreover, the mechanisms linking clinical leadership and organisational improvement are underdeveloped. Drawing on both policy analysis and empirical research, our study has developed an individual and organisational outcome model including a theory of change for clinical leadership, to facilitate rigorous and significant future evaluations.

Our first research question asked what 'clinical leadership' should achieve in a healthcare system like the NHS. We suggested that rather than trying to define what clinical leadership 'is', evaluations should aim to answer what is expected to be achieved in a healthcare system. The literature showed that clinical leadership is expected to help address current healthcare challenges related to increasing complexity of clinical problems, and the financing, organisation and quality of health care. However, the literature did not demonstrate the mechanisms by which clinical leadership of frontline doctors is assumed to address these system-level challenges. Using the UK's National Health System as an example, our analysis of policy documents showed that clinical leadership is seen as a solution to organisational needs through enabling *speeding up good practice at scale, effective inter-professional collaboration, and change and transformation*.

Secondly, we asked how we can depict and conceptualise the professional learning outcomes of clinical leadership development. The analysis of our empirical data from our evaluation of seven cohorts of the Chief Residents Leadership and Management programme in the East of England suggested five outcome constructs for clinical leadership professional development, which we termed: *Self-efficacy, Engaging stakeholders, Boundary-crossing expertise, Agency, and Willingness to take risks and to learn from risks and failures*. We note that, as illustrated in Table 1, our review of analyses of other NHS clinical leadership development programmes (while often more descriptive, and less clearly theoretically framed that ours), showed those have identified several similar phenomena.[36,49,51,52] This lends further support to the theoretical generalisability of our constructs which enrich, and offer conceptual and operational specificity, to findings from earlier empirical work on the outcomes of clinical leadership development which highlighted knowledge and attitudes regarding leadership and working with others.

Finally, we asked how these individual clinical leadership development outcomes are linked with the as-identified desired organisational outcomes. We identified several mechanisms of professional

change enabled by the individual outcomes: *Feeling empowered by knowledge and broadening clinicians' horizons, Identifying new problems and new solutions to known problems, Dialogue across silos and overcoming isolationism, Coming to 'see' one's agency, Resilience with personal/reputational risk, and Lateral spread of leadership (the 'Whither' of leadership) and getting started sooner*. The strong resonance of our findings with theoretically informed research about professional learning and change in healthcare, social care and educational settings[63,68,70,72] supports the wider relevance of our findings beyond their local context.

Our findings also further contribute to professional learning theory in medical settings by illustrating the conceptual and operational links between individual and organisational learning outcomes. We approached the phenomenon systematically from both perspectives, the system-level policy goals and individuals' professional learning, and linked it with professional learning literature outside the clinical domain. Using multiple methods, our study has not only contributed to the conceptualisation of individual learning outcomes, but also added to the literature through identifying the relations between the various levels of individual learning and organisational change.

In short, we believe our study adds to the existing literature in the following ways: (1) by proposing an alternative conceptualisation of leadership development outcomes; (2) by clarifying relationships between challenges on healthcare systems and needs for clinical leadership development, and between individual professional learning outcomes and organisational outcomes; (3) by using a multi-method research approach; and (4) by crossing boundaries between the clinical domain and the professional learning literature through constructs like boundary crossing, self-efficacy and agency.

Our findings have some limitations. As the policy context of our analysis was the UK's NHS, we do not claim direct applicability to other settings. However, healthcare systems globally face similar

challenges; moreover, the strong theoretical resonance of our model supports its wide relevance.

Our dataset is reasonably small and focused on seven cohorts of one clinical leadership development programme, and statistical generalisability is not suggested. However, the particular strengths of our analysis are the time span that our data set covers, the high and evenly spread response rate in our survey, and the rigorous mixed-methods tools applied. In research on educational environments in clinical learning, many models are descriptive or based on qualitative evidence, with few quantitative studies applying factor analyses.[83] The strength of our contribution is the combination of such quantitative analysis with in-depth, qualitative data. While the factors identified are not fully distinct due to the positive tendency in the programme evaluation, and call for further research, they are conceptually supported by relevant theory, and empirically by the interview data, making this a unique contribution to the field. Our strong theoretical foundation and synthesis of prior empirical research means that our model is not conceptually tied to the programme we analysed but can be applied to future analyses and evaluations of clinical leadership development programmes and their individual and organisational impact across the NHS and internationally.

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