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RESEARCH

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Translational framework for implementation evaluation and research: implementation strategies derived from normalization process theory

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Abstract

Background Implementation strategies are deliberate systematic actions used to support the uptake of innovations in health and social care. While widely used taxonomies such as ERIC and EPOC have emerged from consensus exercises, few implementation strategies are explicitly derived from theory and tested against empirical data. This study develops a taxonomy of implementation strategies grounded in Normalization Process Theory (NPT), an implementation theory that explains how new practices become embedded and sustained.

Methods We conducted a qualitative evidence synthesis of studies that reported implementation projects informed by NPT. Studies were identified through citation tracking and database searches, screened using pre-specified criteria, and appraised for methodological quality. Using the NPT coding manual, we identified implementation mechanisms described in each study and translated these into candidate implementation strategies. These were then tested against all included studies through iterative qualitative content analysis.

Result Searches led to 9,147 references, and we then eliminated 5,708 duplicates. After title and abstract screening a further 1,443 were eliminated. Full text screening was undertaken with 1,996 papers, and 1,411 of these were eliminated. This left 585 papers subjected to quality assessment, of which 522 were eliminated. Finally, 63 papers were included in the review. Qualitative analysis of included papers yielded 24 general strategies linked to NPT's theoretical constructs and 96 micro-strategies representing four domains of implementation activity: leadership, information, empowerment, and service user involvement. Each strategy was explicitly linked to an NPT construct.

Conclusions This study provides a theory-based and empirically grounded set of actionable implementation strategies. These are grounded in qualitative descriptions of implementation work. These strategies support practical decision-making across the planning, delivery, and sustainment phases of implementation, and offer context-sensitive guidance for adapting interventions to diverse settings. Unlike consensus-based taxonomies, these strategies are tied to observable mechanisms of action, enabling users to better understand and respond to the dynamic and socially

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organised nature of implementation. The NPT taxonomy of implementation strategies can support the design, tailoring, and operationalisation of implementation efforts across varied health and social care contexts.

Contribution to the literature

(i) This paper presents a taxonomy of implementation strategies explicitly derived from Normalization Process Theory (NPT).

(ii) The NPT Taxonomy of Implementation Strategies provides actionable implementation strategies derived from a systematic qualitative evidence synthesis of empirical studies informed by Normalization Process Theory.

(iii) The NPT Taxonomy of Implementation Strategies spans leadership, information, empowerment, and service user involvement, supporting strategy selection across varied contexts.

(iv) The NPT Taxonomy of Implementation Strategies links to theory-defined and empirically grounded mechanisms of action, offering a contrast to expert consensus taxonomies like ERIC and EPOC.

Background

Implementation strategies are deliberate and systematic methods employed to support the implementation of innovations within health and social care settings. They constitute the ‘how to’ elements of implementation science [1]. Implementation strategies are expected to support the uptake of promising, evidence-based practices in order to achieve improved patient outcomes and more efficient service delivery [2, 3]. We define implementation strategies as: *activities that are embedded in the design and delivery of interventions with the expectation that they will improve implementation outcomes*. Building on this definition, we describe a set of implementation strategies derived from Normalization Process Theory (NPT).

Several taxonomies of implementation strategies have been developed to classify and support the use of these strategies. Among the most commonly used are the Cochrane Effective Practice and Organization of Care Group (EPOC) [4] taxonomy, the ERIC (Expert Recommendations for Implementing Change) taxonomies of implementation strategies [2, 5], and the Behaviour Change Wheel (BCW) [6, 7]. Founded on outstanding scholarship, these frameworks have each shaped how implementation is planned and reported but also face well-documented limitations. The EPOC taxonomy [4], developed within the Cochrane Collaboration, categorises strategies under professional, organisational, financial, and regulatory domains. It is designed to inform systematic reviews, and so is relatively inflexible

and underrepresents the relational, informal, and emergent aspects of implementation processes. In addition, its categories are not linked to mechanisms of change, limiting its capacity to support theory-informed implementation planning or evaluation [8]. The ERIC framework [2, 5] consists of 73 discrete strategies identified through expert consensus meetings and a Delphi study. It is widely used in U.S.-based implementation projects and supports pragmatic, stakeholder-oriented planning. Nonetheless, critiques have pointed to its lack of theoretical coherence, definitional overlap between strategies, and limited explanatory power. Without links to mechanisms, ERIC risks being applied as a checklist rather than a theoretically coherent implementation approach [9]. The Behaviour Change Wheel [6, 7] addresses some of these limitations by linking individual behavioural determinants to intervention functions. It provides a strong theoretical foundation for behaviour-focused interventions. However, the BCW has been criticised for focusing primarily on individual-level behaviour change, with limited applicability to collective action or system-level implementation. Its complexity and resource requirements may also limit its utility in practice [10]. These limitations point to a gap in the implementation science literature: the lack of a strategy framework that is explicitly derived from theory, grounded in empirical data, sensitive to the collective social and organisational dimensions of implementation, and provides actionable strategies that can be implemented across different contexts.

Normalization Process Theory (NPT) [11–19] is an empirically grounded implementation theory [20] that ‘identifies, characterizes, and explains, mechanisms that motivate and shape implementation processes’ [21]. NPT starts from the position that an implementation process occurs ‘when one group of actors seeks to translate their strategic intentions into the everyday practices of others’ [21], and that ‘the essence of an implementation process is to be found in collective action and collaborative work’ [21]. The theory describes key mechanisms that appear to be universal, and that motivate and shape implementation processes. The aim of this study was to develop a set of actionable implementation strategies that are both theoretically derived from and empirically grounded in high quality qualitative research. NPT tells us important things about how implementation processes work and explains barriers and facilitators to successful implementation

[11–19]. It therefore offers a useful foundation for implementation strategies. These can improve the likelihood of successful implementation by addressing both the technical and social dimensions of change. The aim, therefore, of NPT-based implementation strategies is to offer systematic guidance for the translation of strategic intentions into everyday practice [21]. The strategies presented in this paper are aimed at enabling the implementation [22] of evidence-based interventions and innovations in the organisation and delivery of health and social care *within* specific organizational settings. Because well-founded theories provide rational and replicable explanations of phenomena of interest, they support practitioners to better understand and think through the factors influencing implementation outcomes. Such explanations enhance the effectiveness and efficiency of implementation processes. The strategies we have developed here are intended to support implementation practitioners and researchers in the design and delivery of interventions across diverse health and social care settings. The paper addresses a gap in the literature around implementation strategies because it is explicitly derived from a coherent and validated implementation theory, and is also derived from empirical descriptions of implementation processes. This paper contributes a structured taxonomy of strategies that are tightly aligned with NPT constructs and that reflect the work of implementation as described in a systematic qualitative evidence synthesis of 63 peer-reviewed studies.

Methods

This study links the development of a theory-informed coding manual for qualitative data [23], a qualitative evidence synthesis of empirical studies of implementation projects informed by NPT [24], and the development of a set of NPT-grounded implementation strategies. In Fig. 1 we show an example of the sequence of activities leading from an NPT Construct (Collective Action: Interactional Workability) defined in the coding manual, to micro and general strategies identified within the qualitative evidence synthesis.

Qualitative evidence synthesis: of implementation studies informed by normalization process theory

Searches and citation analysis

Our searches updated those of our earlier review [18, 25]. Following the protocol [24], ‘we searched the Scopus and Web of Science bibliographic databases, and Google Scholar, to find publications that cited papers and chapters that developed or expounded the main constructs of NPT [26–32]; papers that developed NPT related methods or tools [33–35]; and citations of the NPT web-enabled on-line toolkit’ [36].

Screening

Title and abstract screening were performed online using Covidence™ software [37]. All potentially eligible citations were obtained in full text. Full text papers were independently screened by AH and CRM. Considerations of eligibility were resolved by discussion.

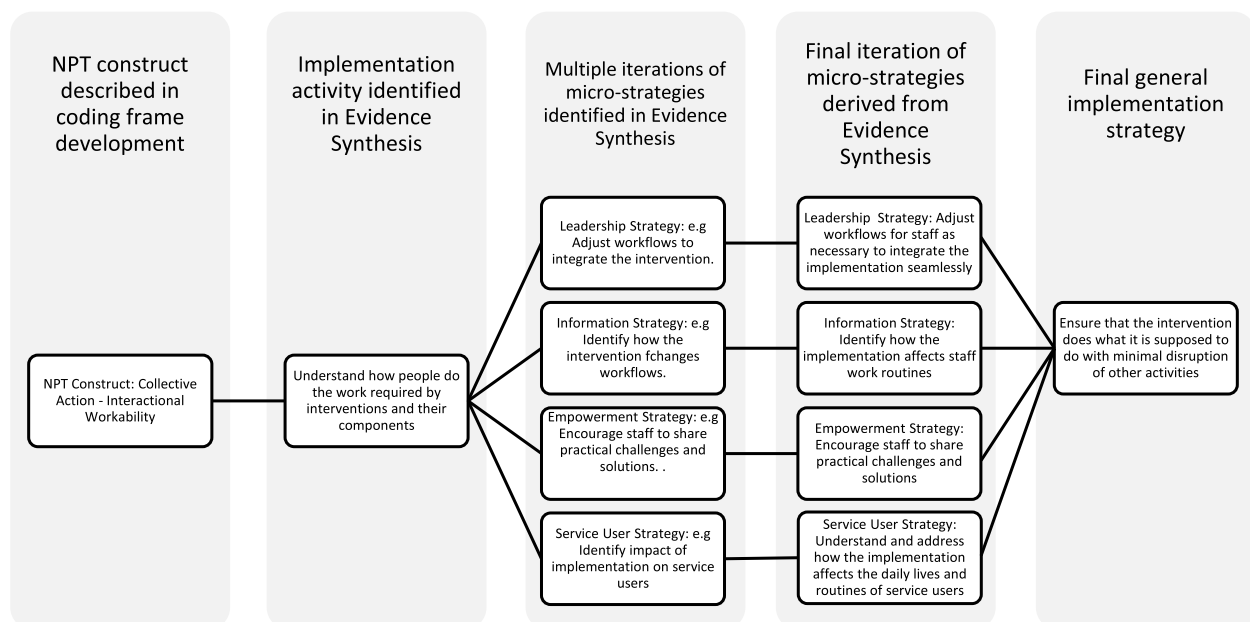


Fig. 1 Sequence of research procedures to produce implementation strategies

Inclusion and exclusion criteria

We included English language peer-reviewed health and healthcare-related journal articles published between 1 June 2006 (the date of publication of the first NPT paper) and 31 December 2021 that employed NPT either solely or in combination with some other theory to report results of (a) primary studies using qualitative or mixed methods, or (b), qualitative evidence syntheses. We excluded editorials or commentaries; protocols and other study designs; research monographs, theses or dissertations; books and book chapters; conference proceedings and abstracts; or webpages, blogs, or other social media. We also excluded peer-reviewed studies that solely report on quantitative study designs; that contained only nominal or passing references to NPT; that were restricted to methodological or theoretical discussions, or made theoretical or methodological recommendations; or that were reports of the application of NPT in settings other than those related to health, healthcare and social care.

Data extraction

Descriptive information was extracted, including authors, year of publication, health care problem addressed, study type and methods, data collection procedures, how NPT was used in the study and whether this had been pre-specified in the study protocol. An Excel file with the extraction instrument and complete information about all included studies is included in [Supplementary Online Documentation](#). Procedures for the extraction of data for analysis are described below.

Quality appraisal

In additional work to identify papers that merited inclusion in the evidence synthesis, we identified those that either scored 'high' (16 or above) when their quality is assessed using the CASP [38] checklist, or that met the definitions developed by Kislov et al. [39, 40] of 'theoretically informed' papers that offer a rigorous non-descriptive analysis, and 'theoretically informative' papers that develop relationships between theoretical constructs or challenge theoretical propositions. All authors participated in quality appraisal.

Qualitative data analysis: development and testing of NPT-informed implementation strategies

The NPT Coding Manual for qualitative research and instrument development [23] provided clear definitions of NPT constructs and subconstructs. It provided a coding framework for qualitative comparative analysis [41] that enabled us to identify potential implementation strategies, and present them in concise form as a theory-based matrix [42]. The matrix and coded data

are presented in [Online Supplementary Documentation](#) (Appendix A). The matrix of strategies was then developed and elaborated through multiple iterations in discussion between CRM, AH, TR, and TLF, a process illustrated in Fig. 1. At the conclusion of the process of iteration we had a clear set of draft implementation micro-strategies and general strategies. Once an agreed set of descriptors of implementation strategies had been defined, we analysed peer reviewed studies of implementation projects informed by NPT [24] included in the synthesis. To do this we used the matrix of implementation strategies as a coding frame for qualitative content analysis [41] of the papers finally included in our qualitative evidence synthesis. All papers were then coded independently against the constructs in the NPT qualitative coding manual [23], in an initial round by CRM and AH. This was repeated independently in a second round by BA, TLF, AG, MG, FSM, SP, and TR. Results of this process are shown in Table 1.

Registration

The protocol for the evidence synthesis was published [24]. However, because the evidence synthesis focused on the development and application of an implementation theory it was not deemed eligible for inclusion in the PROSPERO Register of systematic reviews.

Results

Searches for citations of papers and chapters that utilised the constructs of Normalization Process Theory [22, 26–32, 34, 43]; that developed NPT related methods or tools [33–35]; and citations of the NPT web-enabled on-line toolkit [36] led to 9,147 references, 5,708 of which could be eliminated as duplicates. As Fig. 2 shows, we then checked 3,439 titles and abstracts, and eliminated 1,443 of these, leaving 1,996 papers for full text screening; 1,411 of the latter were eliminated, leaving 585 full papers. Of these, 522 were excluded. Finally, 63 papers that either exceeded a CASP [38] score of 16 or were classified as theoretically informative [39, 40] were included in the review.

Analysis of papers included in the evidence synthesis showed that they identified implementation strategies that occurred *within* organisationally sanctioned implementation processes. In Table 1 we show key outcomes of our qualitative analyses. Each of the 24 constructs of Normalization Process Theory was matched to four implementation activities: leadership, information, empowerment, and service user involvement. From this analysis we derived 96 implementation micro-strategies, and 24 general implementation strategies. The sequence of analytic procedures by which these were produced is described in Fig. 1.

Table 1 NPT construct, implementation micro-strategies and general implementation strategies

NPT Constructs	Implementation Micro-Strategies			General Implementation Strategies	
	Information Strategies (what do staff need to know to contribute to implementation?)	Empowerment Strategies (what needs to be done to equip staff to participate in implementation?)	Service User Strategies (how can service users contribute to implementation?)	Leadership Strategies (what do leaders need to do to promote implementation?)	
NPT Construct: Strategic Intention How do contexts shape the formulation and planning of interventions and their components?	Determine how information about context influences the goals of implementation [44, 45]	Involve a wide range of staff and stakeholders in the planning and share workarounds that differences in perspectives and needs are taken into account [46–48]	Service users should contribute to tailoring the implementation to meet their specific needs and circumstances [49]	Develop a comprehensive plan for staff and service users that outlines the implementation's objectives, taking into account the specific organizational context [45, 50–53]	Undertake collaborative work to build a coherent and inclusive implementation plan for the intervention
NPT Construct: Adaptive Execution How do contexts affect the ways in which users can find and enact workarounds that make an intervention and its components a workable proposition in practice?	Identify aspects of the intervention that might require staff to improvise workarounds or adjustments during implementation	Encourage staff to develop and share workarounds that overcome contextual challenges [54, 55]	Elicit service users' experiences and suggestions of practical workarounds that might not be apparent to healthcare providers [54, 56]	Establish an implementation framework for staff that allows for modifications and adaptations as the implementation is rolled out [47–49, 57–79]	Determine which components of the intervention can be adapted to better fit the target setting
NPT Construct: Negotiated Capacity How do contexts affect the extent that an intervention and its components can fit, or be integrated, into existing ways of working by their users?	Engage with staff at all levels to understand their views on how the implementation can be integrated with current practices	Encourage staff to explore the compatibility of the implementation with their existing practices, structures, and capabilities	Elicit service user perspectives on the alignment of the implementation with their lifeworld and its routines	Collaboratively develop strategies with staff that align the implementation with existing workflows, modifying components where necessary to ensure a better fit [46, 47, 55, 57, 78, 80–83]	Engage stakeholders to ensure the intervention can be integrated in workflows in its target setting
NPT Construct: Reframing organisational logics How do existing social structural and social cognitive resources shape the implementation environment?	Identify those features of the organization expected to affect implementation [59]	Involve key discussions about the organizational implications of implementation [49, 67, 75]	Assess service users' expectations of care	Deliver targeted initiatives (like training programs or policy revisions) for staff to align implementation with organizational goals and structures [44, 64, 84, 85]	Identify features of the target setting that are likely to support implementation
NPT Construct: Coherence building—Differentiation How do people distinguish interventions and their components from their current ways of working?	Show staff how the implementation differs from existing practices [44, 60, 86, 87]	Encourage staff to openly discuss perceived differences and their implications [73, 83, 84, 88–90]	Identify how implementation will lead to differences from service users' current care routines [91]	Deliver targeted training sessions [84]	Clearly articulate how the new intervention improves upon current practices
NPT Construct: Coherence building—Communal specification How do people collectively agree about the purpose of interventions and their components?	Clarify for staff the goals and expected outcomes of the implementation [46, 49, 62, 74, 77, 79, 87, 92, 93]	Facilitate group discussions amongst staff to develop shared understandings of implementation [55–57, 59, 61, 67–69, 80, 89, 94, 95]	Involve service users in consensus building about the goals of the implementation [58, 72]	Develop a consensus documents outlining agreed objectives of implementation [45, 72, 89]	Establish and agree shared goals for the implementation process

Table 1 (continued)

NPT Constructs	Implementation Micro-Strategies			General Implementation Strategies	
	Information Strategies (what do staff need to know to contribute to implementation?)	Empowerment Strategies (what needs to be done to equip staff to participate in implementation?)	Service User Strategies (how can service users contribute to implementation?)	Leadership Strategies (what do leaders need to do to promote implementation?)	
NPT Construct: Coherence building—Individual specification How do people individually understand what interventions and their components require of them?	Determine what each staff member needs to know to implement the intervention effectively [61, 73, 80]	Provide clear, role-specific guidelines and expectations for staff. [47, 62, 73, 85, 87]	Provide targeted information tailored to service user needs and circumstances [96]	Conduct individualized staff training sessions tailored to specific roles and responsibilities	Define and communicate individual roles and responsibilities related to the intervention
NPT Construct: Coherence building—Internalisation How do people construct potential value of interventions and their components for their work?	Identify the value and benefits of implementation for staff [55, 73, 76, 87]	Share success stories about implementation amongst staff [53, 61]	Ensure that service users understand how implementation could improve their care or quality of life [97]	Create and disseminate materials for staff that illustrate the positive outcomes of implementation	Clearly identify the value of the intervention to staff
NPT Construct: Cognitive participation—Initiation How do key individuals drive interventions and their components forward?	Identify key staff who will drive and champion for the implementation [85]	Prepare staff for leadership and train to motivate others [46, 47, 50, 51, 56, 81, 87, 98]	Identify service users who can act as champions for the implementation, sharing their stories and encouraging others to participate	Assign leadership roles to key staff and provide them with the necessary resources [49, 51–53, 56, 60, 82, 83, 88, 90, 99, 100]	Select and support key individuals who will drive the intervention forward
NPT Construct: Cognitive participation—Enrolment How do people join in with interventions and their components? [48]	Understand the process by which staff can become involved in the implementation process	Make staff participation accessible and attractive [44, 48, 68, 69, 72, 85, 96]	Make it easy for service users to get involved, providing clear information and support as needed [45, 57, 60, 61, 74, 75, 79, 81, 83, 84, 86, 89, 91, 94, 96, 99]	Ensure commitment of staff [85, 87, 97]	Eliminate obstacles to participation in the implementation process
NPT Construct: Cognitive participation—Legitimation How do people agree that interventions and their components are the right thing to do and should be part of their work?	Identify the ethical, professional, and organizational justification for the implementation [53, 70]	Encourage staff dialogue about the implementation's legitimacy [49, 55, 62, 67, 79]	Show how participating in the implementation is legitimate from the service user perspective [59, 67, 72, 83]	Organize sessions for staff to discuss its alignment with professional standards and organizational goals [49, 94, 100]	Be clear about how, why, and for who the intervention is the right thing to do
NPT Construct: Cognitive participation—Activation How do people continue to support interventions and their components?	Identify features of the implementation that lead to support from staff [70]	Ensure that staff leaders continuously engage with and support colleagues [75, 77]	Maintain ongoing communication with service users to keep them engaged with the implementation [94]	Implement regular audit and feedback mechanisms to track staff support [52, 56, 58, 87, 94, 101]	Develop strategies to maintain commitment among the implementation team
NPT Construct: Collective action—Interactional workability How do people do the work required by interventions and their components?	Identify how the implementation affects staff work routines [52]	Encourage staff to share practical challenges and solutions. [53, 56, 63, 72, 77, 90, 93, 101]	Understand and address how the implementation affects the daily lives and routines of service users [54, 63, 72, 93]	Adjust workflows for staff as necessary to integrate the implementation seamlessly [48, 87, 93]	Ensure that the intervention does what it is supposed to do with minimal disruption of other activities

Table 1 (continued)

NPT Constructs	Implementation Micro-Strategies			General Implementation Strategies	
	Information Strategies (what do staff need to know to contribute to implementation?)	Empowerment Strategies (what needs to be done to equip staff to participate in implementation?)	Service User Strategies (how can service users contribute to implementation?)	Leadership Strategies (what do leaders need to do to promote implementation?)	
NPT Construct: Collective action—Relational integration How does using interventions and their components affect the confidence that people have in each other?	Understand how the implementation affects relationships between staff [66, 100, 102]	Promote open communication amongst staff about relational dynamics [44, 83, 97]	Consider how the implementation impacts service users trust and confidence in healthcare providers [44, 67]	Facilitate problem solving activities and conflict resolution training for staff [92]	Foster positive and trusting interactions within the team
NPT Construct: Collective action – Skill-set workability How is the work of interventions and their components appropriately allocated to people?	Determine the skill requirements for the implementation [56]	Assess and develop the required skills among staff [45–50, 52, 54, 57, 59, 61–69, 71–73, 75–78, 80–83, 85, 86, 90, 93, 95–97, 99–101, 103]	Provide service users with the knowledge and skills they need to participate effectively in the implementation [70, 71, 85]	Provide targeted training and redistribute tasks according to skill sets [45–50, 52, 54, 57, 59, 61–69, 71–73, 75–78, 80–83, 85, 86, 90, 93, 95–97, 99–101, 103]	Ensure staff have the skills required for effective implementation
NPT Construct: Collective action – Contextual integration How is the work of interventions and their components supported by host organizations?	Gauge organizational readiness and resource availability [58]	Involve management in resource allocation and support [96]	Ensure that service user participation is actively supported by the host organisation [58, 92, 93]	Align organizational resources and policies to support the implementation [45, 48, 55, 58, 59, 61, 77, 82, 92, 93, 95, 96]	Demonstrate organizational commitment and support for interventions
NPT Construct: Reflexive monitoring – Systematisation How do people access information about the effects of interventions and their components?	Establish a system for monitoring the implementation's effects [56, 60, 61, 64, 72, 84, 94, 99, 102]	Train staff to use monitoring tools effectively [65, 87]	Involve service users in monitoring the implementation and provide them with feedback on progress [71]	Implement and maintain a data collection and analysis system [56, 63, 67, 77, 79, 93, 95, 97, 102, 103]	Deploy systems to track progress and outcomes of the intervention
NPT Construct: Reflexive Monitoring – Communal appraisal How do people collectively assess interventions and their components as worthwhile?	Determine criteria for assessing the implementation's worth to staff [57, 68, 69, 81, 88, 89, 100, 102]	Involve staff in evaluating the implementation's effectiveness [78, 90, 101]	Include service users in the evaluation of the implementation, ensuring their perspectives are considered in any assessments of its worth [58, 103]	Conduct regular review meetings and surveys for communal feedback [44, 46, 80, 99]	Create opportunities to continually improve the implementation process
NPT Construct: Reflexive Monitoring – Individual appraisal: How do people individually assess interventions and their components as worthwhile?	Understand personal evaluations of the implementation	Encourage individual reflection and feedback [90]	Encourage and facilitate individual feedback from service users about their experiences with the implementation	Create channels for private feedback and personal reflection sessions	Create safe spaces for personal feedback about the implementation process

Table 1 (continued)

NPT Constructs	Implementation Micro-Strategies			General Implementation Strategies	
	Information Strategies (what do staff need to know to contribute to implementation?)	Empowerment Strategies (what needs to be done to equip staff to participate in implementation?)	Service User Strategies (how can service users contribute to implementation?)	Leadership Strategies (what do leaders need to do to promote implementation?)	
NPT Construct: Reflexive Monitoring – Reconfiguration How do people modify their work in response to their appraisal of interventions and their components?	Identify necessary changes based on implementation appraisal by staff [49, 51, 56, 74–76, 78, 84, 96, 98, 100, 101, 103]	Allow staff to suggest and trial modifications [51–53, 55, 78, 86, 87, 95, 96, 102]	Be responsive to feedback from service users, and be prepared to make changes based on their experiences and suggestions [45, 63]	Facilitate an adaptable approach, revising practices based on staff feedback [45, 47, 50, 51, 60, 62, 66, 71–75, 77, 81–83, 90–92, 97, 99, 101]	Revise implementation process based on staff feedback
NPT Construct: Intervention performance What practices have changed as the result of interventions and their components being operationalized, enacted, reproduced, over time and across settings?	Identify key metrics and indicators to measure changes in practices [47]	Encourage and enable staff to recognize and report changes in their practices	Identify service user reported outcomes of the implementation	Implement regular evaluation tasks for staff, to measure the implementation's impact on practices [80]	Train staff to understand and contribute to the evaluation process
NPT Construct: Relational restructuring How has working with interventions and their components changed the ways people are organized and relate to each other?	Determine how staff relationships and team dynamics have shifted due to the implementation	Facilitate open dialogue and feedback sessions for staff to express how their interactions and relationships have been affected [45]	Determine how the implementation has affected the relationships between patients, caregivers, and healthcare providers	Conduct workshops or team-building activities for staff to address and adapt to any changes in organizational relationships and structures	Update team structures to take account of change brought about by the implementation process
NPT Construct: Normative restructuring How have working with interventions and their components changed the norms, rules and resources that govern action?	Assess how implementation has influenced the norms, rules, and resource distribution within the organization	Involve staff in reviewing and revising policies and norms to align with the implementation	Identify the impact on service users of changes in norms, or resources that affect them	Update organizational policies, procedures, and resource allocation strategies to reflect the changes brought by the implementation	Update organisational policies and guidelines to take account of changes brought about by the implementation process
NPT Construct: Sustainment (normalisation) How have interventions and their components become incorporated in practice?	Identify the factors that contribute to the successful integration and routinization of implementation	Enable continuous engagement and ownership among staff to sustain the implementation	Work with service users to identify what factors will contribute to the successful incorporation of the implementation into their everyday lives	Integrate the implementation into standard operating procedures and ongoing training programs, ensuring it becomes a regular part of organizational practice	Be clear about how to decide if implementation has been successful, and for who

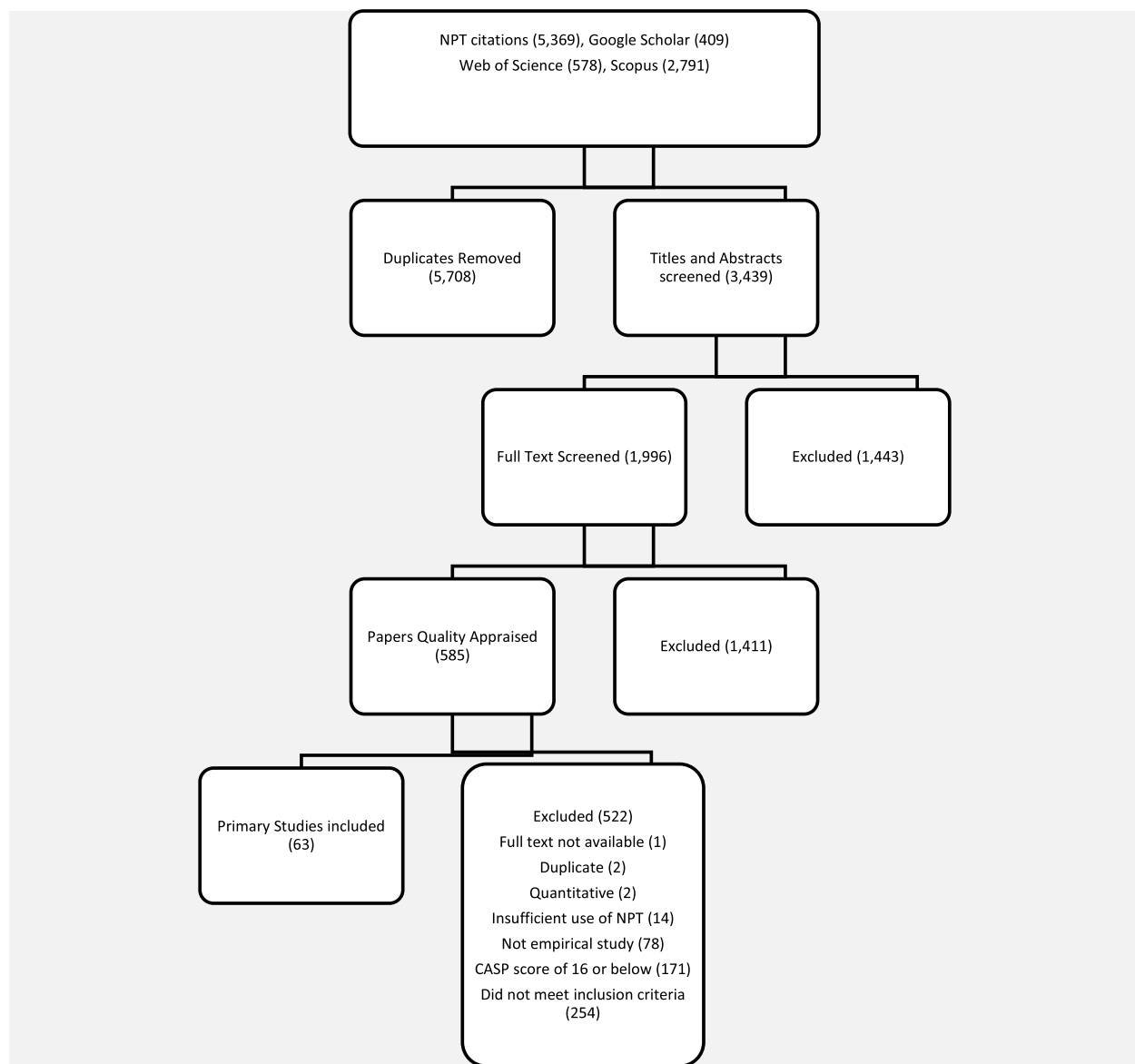


Fig. 2 PRISMA flowchart

Leadership strategies: what do leaders need to do to deliver implementation?

Leadership is fundamental to the successful organization and delivery of implementation projects [44]. Leaders' roles in establishing an implementation framework for staff that allows for modifications and adaptations as the implementation is rolled out was centrally important [45–70]. Strategies that promoted consensus about the objectives of implementation [60, 71, 72] were linked to aligning implementation with existing workflows, modifying intervention components where necessary to ensure a better fit [45, 62, 69, 73–78], and

to aligning organizational resources and policies to support implementation [46, 47, 49, 52, 67, 68, 71, 76, 78–85]. Not surprisingly, targeted training and redistribution of tasks was seen as a core implementation strategy [45, 47, 49–57, 59–63, 65–69, 71, 73–77, 80–82, 84–95]. Relevant strategies included assigning leadership roles and resources to others [48, 61, 76, 77, 86, 88, 89, 92, 96–99], taking into account the specific organizational context in which these roles are worked out [71, 87, 92, 98, 99]. Orienting leadership work in this way was seen as facilitating adaptation, revising practices based on staff feedback [48, 50, 54, 59, 60, 62–65, 68, 71, 75–77, 79, 86–88,

94, 95, 98, 100], ensuring its alignment with professional standards and organizational goals [61, 89, 101], along with adjusting workflows for staff as necessary to integrate the implementation seamlessly [67, 80, 102]. Strategies like audit and feedback mechanisms may influence the conduct of implementation processes [46, 92, 95, 97, 101, 102], but they rely on leaders committing to maintaining a system for data collection and analysis about the progress of implementation projects [51, 55, 68, 70, 80, 82, 90, 94, 97, 103]. These might include review meetings and surveys to obtain feedback [73, 74, 83, 86], enacting problem solving activities and conflict resolution [79], and seeking ways to secure the continued commitment of participating staff [85, 94, 102].

Information strategies: what do staff need to know?

Determining what staff need to know about the planned process of implementation is a strategically important problem, in part because shared knowledge about action is a fundamental requirement for its coordination [104]. However, although there were many references to training and education to equip staff to operationalise interventions, there were surprisingly few references to attempts to determine what staff need to know to effectively perform implementation [49, 63, 74], and to understand how the implementation differs from existing practices [48, 83, 91, 102]. There was an emphasis on staff knowing about and understanding the goals and expected outcomes of an implementation process [50, 61, 64, 68, 70, 73, 79, 80, 102], along with its value [63, 66, 78, 102] and hence its justification [58, 99], along with the ways that it might affect relationships between staff [54, 58, 89, 103] and their routines and skill requirements [97]. More mechanistically, studies proposed that it was important to establish a system for monitoring the implemented intervention's effects [48, 49, 52, 60, 84, 86, 97, 101, 103], for assessing its worth to staff [45, 56, 57, 72, 75, 89, 96, 103], and for making necessary changes based on implementation appraisal by staff [61, 64–66, 69, 81, 84, 89, 90, 95, 97, 98, 105].

Empowerment strategies: how can staff participate in implementation?

Information on its own is an insufficient foundation for coordinated translational action. Strategies that build empowerment emphasise the development of required skills among staff [32, 45, 47, 49–57, 59–63, 65–69, 71, 73–77, 80–82, 85–95]. These strategies prepare participants for leadership and can include training to motivate others [62, 73, 75, 87, 97, 98, 102, 105]. An important feature of empowerment strategies was the facilitation of group discussions amongst staff to develop shared understandings of implementation processes [45, 47,

49, 55–57, 72, 74, 78, 82, 97, 101]; to openly discuss perceived differences and their implications [63, 72, 77, 84, 88, 96]; to develop and share workarounds that overcome contextual challenges [51, 60, 68, 78, 80, 88, 93, 95, 97, 99]; and to engage in discussions about the organizational implications of implementation [55, 61, 65]. Whilst training and adaptation play an important part in empowering participants in implementation processes, other strategies also stem from them. Here, ways need to be found to involve a wide range of staff and stakeholders in the planning to ensure that differences in perspectives and needs are taken into account [62, 67, 73], and roles and expectations are understood and accepted [50, 62, 63, 85, 102]. Equally, staff participation needs to be made accessible and attractive [56, 57, 60, 67, 81, 83, 85], perhaps through shared success stories [49, 99], and discussion about the legitimacy of an implementation process [50, 55, 61, 70, 78]. Participating staff can be further empowered by creating opportunities to suggest and explore modifications to implementation processes [69, 78, 81, 82, 91, 92, 98, 99, 102, 103].

Service user strategies: how can intervention beneficiaries contribute to implementation?

Involvement of service users and caregivers in studies included in the review was variable and often cursory, reflecting the differences in research cultures and healthcare systems of included countries. Included studies emphasised the need to make it easy for service users to get involved, providing clear information and support as needed [45, 48, 49, 64, 65, 70–72, 75, 77, 81, 84, 86, 91, 100, 101]. This included involving service users in consensus building about the goals of the implementation [46, 60], and exploring how participation is legitimate from the service user perspective [47, 55, 60, 77]. Reciprocal participation from service users and caregivers included exploring their experiences and suggestions of practical workarounds that might not be apparent to healthcare providers [93, 97]. These took into account and addressed how the implementation affected the daily lives and routines of service users [51, 60, 80, 93]. Service users needed to be provided with targeted information and skills required to participate effectively in the implementation [58, 59, 85], and their participation had to be actively supported by the host organisation [46, 79, 80]. Also important was evidence of responsiveness to feedback from service users, and willingness to make changes based on their experiences and suggestions [51, 71].

Discussion

Normalization Process Theory offers an approach to understanding how implementation work is organized, enacted, and sustained. By identifying empirically

observed implementation mechanisms, NPT provides a foundation for developing actionable strategies. Our strategy development process maintained a clear commitment to the core constructs of the theory, ensuring that each proposed strategy could be directly traced to an observed mechanism within empirical studies. The second contribution of our development process is the structuring of strategies around key operational foci: leadership, information, empowerment, and service user engagement. These categories emerged inductively through analysis of empirical material, reflecting how implementation work is actually organized rather than how it is assumed to occur. Notably, service user focused implementation strategies are relatively underdeveloped in the literature, suggesting an important area for further research and refinement. Unlike EPOC [4], ERIC [2, 5], and the Behaviour Change Wheel (BCW) [6, 7], which build on expert consensus meetings and Delphi studies, our approach to the development of implementation strategies builds directly on theory-informed empirical observations of reported implementation processes. In doing so, it offers an alternative foundation for the design and delivery of implementation strategies that aims for both greater theoretical coherence and empirical grounding.

Existing strategy taxonomies are founded on outstanding scholarship and have been highly influential in shaping implementation practice. EPOC's [4] focus on health systems interventions, ERIC's categorization of strategies to address known barriers [2, 5], and the BCW's emphasis on linking behavioural determinants to intervention functions [6, 7], have each advanced the field. This introduces a potential weakness, around construct validity and the risk of strategies being artefacts of expert classification and interpretation rather than reflections of real-world dynamics. Our approach directly addresses this problem by linking strategy development to mechanisms that are consistently revealed across empirical studies of implementation processes.

Using NPT-derived implementation strategies

During the delivery phase of an implementation project, the strategies described in this paper could be selected, tailored, and operationalized through a detailed action plan that is founded on a structured method—for example, implementation mapping [106, 107]—that specifies not just methods to select strategies to be executed, but also those responsible for executing them, the resources required to support these activities, and the timelines for each strategy [2]. Throughout an implementation project, process evaluations can explore the effectiveness of implementation strategies in real-time, allowing for continuous adjustment and refinement. This dynamic

approach ensures that strategies remain relevant and effective, enhancing the sustainability of the implementation. By integrating these strategies into the design and delivery phases, implementation facilitators and others can foster a comprehensive and adaptable implementation process, thereby increasing the likelihood of successful and sustained change.

Strengths and limitations

A key strength of this study is that it starts from structured analysis of implementation mechanisms rather than experiential consensus meetings on interventions. The systematic use of the NPT coding manual [23] as a foundation for qualitative comparative analysis to extract and structure the strategies ensures transparency and, as far as is possible in qualitative investigation, replicability. The analysis addresses a recognised gap in the literature by providing a theory-based taxonomy of implementation strategies, linked to mechanisms of action. This adds value to their practical relevance and ensures that they are informed by descriptions of implementation work drawn from diverse healthcare contexts. The presentation of both micro-strategies and general implementation strategies supports flexible application across varied implementation settings and resource conditions. However, there are several limitations to our study. The qualitative evidence synthesis was of studies not designed to describe implementation strategies. This means that strategy identification depended on interpretive coding rather than direct observation or reporting. Furthermore, the evidence synthesis focused exclusively on studies that employed NPT. A risk in qualitative studies like this is hidden interpretive bias resulting from philosophical commitment to a particular theory, model or framework in implementation science. To counter this, three authors (BA, RK, SP) were recruited to this study because their disciplinary and theoretical allegiances lie elsewhere. It is possible that if we had used a different conceptual framework, or reviewed different reports of empirical studies, we might have produced a different set of implementation strategies.

Conclusion

By deriving implementation strategies from Normalization Process Theory and grounding them in empirical observations drawn from papers included in a qualitative evidence synthesis, this paper provides a structured taxonomy of implementation strategies. Ensuring that theory-derived strategies can be linked to empirically observed practices ensures that mechanisms of change can be identified and understood. Implementation strategies should support both *thinking* and *doing* by leaders, practitioners, and researchers, as they

design interventions and implementation projects. The contexts of implementation research and practice are complex, dynamic, and emergent, and structured through professional, organisational, and political hierarchies of power, influence, and control. The implementation strategies identified in this paper may not only help managers, practitioners, researchers, patients, and caregivers as they think through delivering change, but they might also represent day-to-day tools for responding to complexity and emergence as change takes place. Therefore, focusing on activities that are critical for supporting implementation enables us to offer a more nuanced understanding of the ways that strategies are operationalised according to the specific needs and contexts of implementation practitioners.

Abbreviations

BCW	Behaviour Change Wheel
CASP	Critical Appraisal Skills Programme
EHR	Electronic Health Record
ERAS	Enhanced Recovery After Surgery
ERIC	Expert Recommendations for Implementing Change
EPOC	Effective Practice and Organization of Care
ePRO	Electronic patient reported outcome measure in renal service
G-AP	Goal setting and action planning
GPs	General Practitioners
NIHR	National Institute of Health and Social Care Excellence
NPT	Normalization Process Theory
PCT	Primary Care Trust
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PPI	Patient and Public Involvement
SSC	Surgical Safety Checklist
VIG	Video Interaction Guidance

Supplementary Information

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Supplementary Material 1

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Authors' contributions

Conceptualization: CRM, AH, BA, LD, AG, MG, RK, AMacF, FSM, SP, TR, TLF. Methodology: CRM, AH, TF, TR. Validation: Verification of results. CRM, AH, TLF, TR, RK, SP, BA, AMacF. Formal Analysis: CRM, AH, BA, LD, AG, MG, RK, AMacF, FSM, SP, TR, TLF. Investigation: CRM, AH, BA, LD, AG, MG, RK, AMacF, FSM, SP, TR, TLF.

Writing – Original Draft: CRM, AH. Writing – Review & Editing: BA, LD, AG, MG, RK, AMacF, FSM, SP, TR, TLF. Supervision: CRM. Funding Acquisition: CRM.

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Data availability

All data generated or analysed during this study are included in this article or in the attached online supplementary documentation.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

CRM, and TR are members of the Editorial Board of *Implementation Science*. CRM, AH, LD, AG, MG, AMacF, FSM, TR, TLF have led or contributed to the development of Normalization Process Theory.

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References

1. Nilsen P, Augustsson H. Implementation strategies and outcomes. In: Nilsen P, editor. *Implementation Science: Theory and Application*. London: Routledge; 2024. p. 99–113.
2. Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting. *Implement Sci*. 2013;8:139.
3. Powell BJ, Proctor EK, Glass JE. A Systematic Review of Strategies for Implementing Empirically Supported Mental Health Interventions. *Res Soc Work Pract*. 2014;24(2):192–212.
4. Freemantle N, Grilli R, Grimshaw J, Oxman A. Implementing findings of medical research: the Cochrane Collaboration on Effective Professional Practice. *Qual Health Care*. 1995;4(1):45–7.
5. Powell BJ, McMillen JC, Proctor EK, Carpenter CR, Griffey RT, Bunger AC, Glass JE, York JL. A compilation of strategies for implementing clinical innovations in health and mental health. *Med Care Res Rev*. 2012;69(2):123–57.
6. Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci*. 2011;6:42.

7. Fishbein M, Triandis HC, Kanfer FH, Becker M, Middlestadt SE, Eichler A. Factors influencing behavior and behavior change. *Handbook of health psychology*. 2001;3(1):3–17.
8. Boaz A, Baeza J, Fraser A, Persson E. 'It depends': what 86 systematic reviews tell us about what strategies to use to support the use of research in clinical practice. *Implement Sci*. 2024;19(1):15.
9. Nathan N, Powell BJ, Shelton RC, Laur CV, Wolfenden L, Hailemariam M, Yoong SL, Sutherland R, Kingsland M, Waltz TJ et al: Do the Expert Recommendations for Implementing Change (ERIC) strategies adequately address sustainment? *Frontiers in Health Services* 2022, Volume 2 - 2022.
10. Ross AJ, Reedy GB, Roots A, Jaye P, Birns J. Evaluating multisite multiprofessional simulation training for a hyperacute stroke service using the Behaviour Change Wheel. *BMC Med Educ*. 2015;15:143.
11. McEvoy R, Ballini L, Maltoni S, O'Donnell C, Mair F, MacFarlane A: A qualitative systematic review of studies using the normalization process theory to research implementation processes. *Implement Sci*. 2014;9(1):2.
12. Huddleston L, Turner J, Eborall H, Hudson N, Davies M, Martin G. Application of normalisation process theory in understanding implementation processes in primary care settings in the UK: a systematic review. *BMC Fam Pract*. 2020;21(1):1–16.
13. Price C, Suhomlinova O, Green W. Researching big IT in the UK National Health Service: A systematic review of theory-based studies. *Int J Med Inform*. 2024;185: 105395.
14. Leresche E, Hossain M, De Rubeis ML, Hermans V, Burtscher D, Rossi R, Lonsdale C, Singh NS: How is the implementation of empirical research results documented in conflict-affected settings? Findings from a scoping review of peer-reviewed literature. *Confl Health* 2023, 17(1).
15. Roach A, Cullinan S, Shafran R, Heyman I, Bennett S. Implementing brief and low-intensity psychological interventions for children and young people with internalizing disorders: a rapid realist review. *Br Med Bull*. 2023;145(1):120–31.
16. Ataman R, Ahmed S, Zidan A, Thomas A. Understanding How Newly Implemented Rehabilitation Best Practices Are Sustained: A Realist Review. *Arch Phys Med Rehabil*. 2022;103(12):2429–43.
17. Dalkin SM, Hardwick RJ, Haighton CA, Finch TL. Combining Realist approaches and Normalization Process Theory to understand implementation: a systematic review. *Implementation Science Communications*. 2021;2(1):1–13.
18. May CR, Cummings A, Girling M, Bracher M, Mair FS, May CM, Murray E, Myall M, Rapley T, Finch T. Using Normalization Process Theory in feasibility studies and process evaluations of complex healthcare interventions: a systematic review. *Implement Sci*. 2018;13(1):80.
19. Overbeck G, Davidsen AS, Kousgaard MB. Enablers and barriers to implementing collaborative care for anxiety and depression: a systematic qualitative review. *Implement Sci*. 2016;11(1):165.
20. Nilsen P: Making sense of implementation theories, models and frameworks. *Implementation Science* 2015, 10.
21. May C, Rapley T, Finch T. Normalization Process Theory. In: Nilsen P, Birken S, editors. *International Handbook of Implementation Science*. London: Edward Elgar; 2020. p. 144–67.
22. May C, Finch T. Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology*. 2009;43(3):535–54.
23. May CR, Albers B, Bracher M, Finch TL, Gilbert A, Girling M, Greenwood K, MacFarlane A, Mair FS, May CM, et al. Translational framework for implementation evaluation and research: a normalisation process theory coding manual for qualitative research and instrument development. *Implement Sci*. 2022;17(1):19.
24. May CR, Albers B, Desveaux L, Finch TL, Gilbert A, Hillis A, Girling M, Kislov R, MacFarlane A, Mair FS, et al. Translational framework for implementation evaluation and research: Protocol for a qualitative systematic review of studies informed by Normalization Process Theory (NPT) [version 1; peer review: 2 approved]. *NIHR Open Res*. 2022;2:41.
25. Bowers HM, Kendrick T, Glowacka M, Williams S, Leydon G, May C, Dowrick C, Moncrieff J, Laine R, Nestoriuc Y et al: Supporting antidepressant discontinuation: The development and optimisation of a digital intervention for patients in UK primary care using a theory, evidence and person-based approach. *Bmj Open* 2020, 10(3).
26. May C. A rational model for assessing and evaluating complex interventions in health care. *BMC Health Serv Res*. 2006;6(86):1–11.
27. May C, Finch T, Mair F, Ballini L, Dowrick C, Eccles M, Gask L, MacFarlane A, Murray E, Rapley T et al: Understanding the implementation of complex interventions in health care: the normalization process model. *Bmc Health Services Research* 2007, 7(148).
28. May CR, Mair FS, Dowrick CF, Finch TL: Process evaluation for complex interventions in primary care: understanding trials using the normalization process model. *BMC Family Practice* 2007, 8.
29. May C, Finch T. Implementation, embedding, and integration: an outline of Normalization Process Theory. *Sociology*. 2009;43(3):535–54.
30. May C, Mair FS, Finch T, MacFarlane A, Dowrick C, Treweek S, Rapley T, Ballini L, Ong BN, Rogers A et al: Development of a theory of implementation and integration: Normalization Process Theory. *Implementation Science* 2009, 4(29).
31. May C. Agency and implementation: Understanding the embedding of healthcare innovations in practice. *Soc Sci Med*. 2013;78:26–33.
32. May C. Towards a general theory of implementation. *Implement Sci*. 2013;8(1):18.
33. Murray E, Treweek S, Pope C, MacFarlane A, Ballini L, Dowrick C, Finch T, Kennedy A, Mair F, O'Donnell C, et al. Normalisation process theory: a framework for developing, evaluating and implementing complex interventions. *BMC Med*. 2010;8(1):63.
34. Finch TL, Rapley T, Girling M, Mair FS, Murray E, Treweek S, McColl E, Steen IN, May CR: Improving the normalization of complex interventions: measure development based on normalization process theory (NoMAD): study protocol. *Implementation Science* 2013, 8.
35. Finch T, Mair F, O'Donnell C, Murray E, May C: From theory to 'measurement' in complex interventions: Methodological lessons from the development of an e-health normalisation instrument. *BMC Medical Research Methodology* 2012, 12(69).
36. May C, Finch T, Ballini L, MacFarlane A, Mair F, Murray E, Treweek S, Rapley T. Evaluating Complex Interventions and Health Technologies Using Normalization Process Theory: Development of a Simplified Approach and Web-Enabled Toolkit. *BMC Health Serv Res*. 2011;11(1):245.
37. Veritas Health Innovation M, Australia. : Covidence systematic review software <https://www.covidence.org>. In.; 2021.
38. Programm CAS: CASP Qualitative Checklist. [online] Available at: <https://casp-uk.net/>. Accessed: 14 Feb 2022. In.; 2018.
39. Kislov R. Engaging with theory: from theoretically informed to theoretically informative improvement research. *BMJ Qual Saf*. 2019;28(3):177–9.
40. Kislov R, Pope C, Martin GP, Wilson PM. Harnessing the power of theorising in implementation science. *Implement Sci*. 2019;14(1):103.
41. Schreier M: Qualitative content analysis in practice. Los Angeles: SAGE; 2012.
42. Miles MB, Huberman AM, Saldaña J: Qualitative data analysis : a methods sourcebook, Fourth edition. edn. Los Angeles: SAGE; 2020.
43. May C, Montori VM, Mair FS: We need minimally disruptive medicine. *BMJ* 2009, 339(aug11_2):b2803-.
44. Czarniawska B: A theory of organizing: Edward Elgar Publishing; 2008.
45. Ankersen PV, Steffensen RG, Blaehr EE, Beedholm K: Bumpy road: implementing integrated psychiatric and somatic care in joint-specialty emergency departments: a mixed-method study using Normalization Process Theory. *Journal of Integrated Care* 2021.
46. Blickem C, Kennedy A, Jariwala P, Morris R, Bowen R, Vassilev I, Brooks H, Blakeman T, Rogers A: Aligning everyday life priorities with people's self-management support networks: an exploration of the work and implementation of a needs-led telephone support system. *BMC Health Services Research* 2014, 14.
47. Burau V, Carstensen K, Fredens M, Kousgaard MB: Exploring drivers and challenges in implementation of health promotion in community mental health services: a qualitative multi-site case study using Normalization Process Theory. *BMC Health Services Research* 2018, 18.
48. French B, Thomas LH, Harrison J, Burton CR, Forshaw D, Booth J, Britt D, Cheater FM, Roe B, Watkins CL. Implementing a Systematic Voiding Program for Patients with Urinary Incontinence after Stroke. *Qual Health Res*. 2016;26(10):1393–408.
49. Gibson J, Lightbody E, McLoughlin A, McAdam J, Gibson A, Day E, Fitzgerald J, May C, Price C, Emsley H, et al. "It was like he was in the room with us": patients' and carers' perspectives of telemedicine in acute stroke. *Health Expect*. 2016;19(1):98–111.

50. Hall A, Finch T, Kolehmainen N, James D: Implementing a video-based intervention to empower staff members in an autism care organization: a qualitative study. *BMC Health Services Research* 2016, 16.
51. Herber OR, Ehringfeld I, Steinhoff P, Whittal A: Identifying relevant factors for successful implementation into routine practice: expert interviews to inform a heart failure self-care intervention (ACHIEVE study). *BMC Health Services Research* 2021, 21(1).
52. Hind D, Parkin J, Whitworth V, Rex S, Young T, Hampson L, Sheehan J, Maguire C, Cantrill H, Scott E et al: Aquatic therapy for children with Duchenne muscular dystrophy: a pilot feasibility randomised controlled trial and mixed-methods process evaluation. *Health Technology Assessment* 2017, 21(27):1–4.
53. Holopainen R, Piirainen A, Karppinen J, Linton SJ, O'Sullivan P: An adventurous learning journey. Physiotherapists' conceptions of learning and integrating cognitive functional therapy into clinical practice. *Physiotherapy Theory and Practice* 2020.
54. Jeffries M, Salema NE, Laing L, Shamsuddin A, Sheikh A, Avery A, Chuter A, Waring J, Keers RN: The implementation, use and sustainability of a clinical decision support system for medication optimisation in primary care: A qualitative evaluation. *Plos One* 2021, 16(5).
55. Keenan J, Poland F, Boote J, Howe A, Wythe H, Varley A, Vicary P, Irvine L, Wellings A: 'We're passengers sailing in the same ship, but we have our own berths to sleep in': Evaluating patient and public involvement within a regional research programme: An action research project informed by Normalisation Process Theory. *Plos One* 2019, 14(5).
56. Kennedy A, Rogers A, Bowen R, Lee V, Blakeman T, Gardner C, Morris R, Protheroe J, Chew-Graham C: Implementing, embedding and integrating self-management support tools for people with long-term conditions in primary care nursing: A qualitative study. *Int J Nurs Stud*. 2014;51(8):1103–13.
57. Kennedy A, Rogers A, Chew-Graham C, Blakeman T, Bowen R, Gardner C, Lee V, Morris R, Protheroe J: Implementation of a self-management support approach (WISE) across a health system: a process evaluation explaining what did and did not work for organisations, clinicians and patients. *Implementation Science* 2014, 9.
58. Knowles S, Cotterill S, Coupe N, Spence M: Referral of patients to diabetes prevention programmes from community campaigns and general practices: mixed-method evaluation using the RE-AIM framework and Normalisation Process Theory. *BMC Health Services Research* 2019, 19.
59. Knowles SE, Ercia A, Caskey F, Rees M, Farrington K, Van der Veer SN: Participatory co-design and normalisation process theory with staff and patients to implement digital ways of working into routine care: the example of electronic patient-reported outcomes in UK renal services. *BMC Health Serv Res*. 2021;21(1):1–11.
60. Leitch S, Smith A, Crengle S, Stokes T: The views of New Zealand general practitioners and patients on a proposed risk assessment and communication tool: a qualitative study using Normalisation Process Theory. *Implement Sci Commun*. 2021;2(1):16.
61. Ling T, Brereton L, Conklin A, Newbould J, Roland M: Barriers and facilitators to integrating care: experiences from the English Integrated Care Pilots. *International Journal of Integrated Care* 2012, 12.
62. McCrorie C, Benn J, Johnson OA, Scantlebury A: Staff expectations for the implementation of an electronic health record system: a qualitative study using normalisation process theory. *Bmc Medical Informatics and Decision Making* 2019, 19(1).
63. Nicoll A, Maxwell M, Williams B: Achieving "coherence" in routine practice: a qualitative case-based study to describe speech and language therapy interventions with implementation in mind. *Implement Sci Commun*. 2021;2(1):56.
64. Nwoliwe C, Corrie P, Fitzpatrick R, Gupta A, Jenkinson C, Middleton M, Martin R: Burden of cancer trial participation: A qualitative sub-study of the INTERIM feasibility RCT. *Chronic Illness* 2021.
65. Ong BN, Hodgson D, Small N, Nahar P, Sanders C: Implementing a digital patient feedback system: an analysis using normalisation process theory. *BMC Health Services Research* 2020, 20(1).
66. Paleri V, Patterson J, Rousseau N, Moloney E, Craig D, Tzelis D, Wilkinson N, Franks J, Hynes AM, Heaven B et al: Gastrostomy versus nasogastric tube feeding for chemoradiation patients with head and neck cancer: the TUBE pilot RCT. *Health Technology Assessment* 2018, 22(16):1–4.
67. Read S, Morgan J, Gillespie D, Nolleck C, Weiss M, Allen D, Anderson P, Waterman H: Normalisation process theory and the implementation of a new glaucoma clinical pathway in hospital eye services: Perspectives of doctors, nurses and optometrists. *Plos One* 2021, 16(8).
68. Rosstad T, Garasen H, Steinsbekk A, Haland E, Kristoffersen L, Grimsmo A: Implementing a care pathway for elderly patients, a comparative qualitative process evaluation in primary care. *BMC Health Services Research* 2015, 15.
69. Sanders T, Ong BN, Sowden G, Foster N: Implementing change in physiotherapy: professions, contexts and interventions. *J Health Organ Manag*. 2014;28(1):96–114.
70. Wilson P, Mathie E, Keenan J, McNeilly E, Goodman C, Howe A, Poland F, Staniszewska S, Kendall S, Munday D: ReseArch with Patient and Public involvement: a realist evaluation: the RAPPORT study. *Health Services and Delivery Research* 2015.
71. Finch TL, Bamford C, Deary V, Sabin N, Parry SW: Making sense of a cognitive behavioural therapy intervention for fear of falling: qualitative study of intervention development. *BMC Health Services Research* 2014, 14.
72. Franx G, Oud M, de Lange J, Wensing M, Grol R: Implementing a stepped-care approach in primary care: results of a qualitative study. *Implementation Science* 2012, 7.
73. Carstensen K, Broström Kousgaard M, Burau V: Sustaining an intervention for physical health promotion in community mental health services: A multisite case study. *Health Soc Care Community*. 2019;27(2):502–15.
74. Chudleigh J, Holder P, Moody L, Simpson A, Southern K, Morris S, Fusco F, Ulph F, Bryon M, Bonham JR, et al. Process evaluation of co-designed interventions to improve communication of positive newborn bloodspot screening results. *BMJ Open*. 2021;11(8): e050773.
75. Gordon K, Dainty KN, Steele Gray C, DeLacy J, Shah A, Resnick M, Seto E. Experiences of Complex Patients With Telemonitoring in a Nurse-Led Model of Care: Multimethod Feasibility Study. *JMIR Nurs*. 2020;3(1): e22118.
76. Holtrop JS, Potworowski G, Fitzpatrick L, Kowalk A, Green LA: Effect of care management program structure on implementation: a normalization process theory analysis. *BMC Health Services Research* 2016, 16.
77. Leon N, Lewin S, Mathews C: Implementing a provider-initiated testing and counselling (PITC) intervention in Cape town, South Africa: a process evaluation using the normalisation process model. *Implementation Science* 2013, 8.
78. Scobbie L, Duncan EAS, Brady MC, Thomson K, Wyke S: Facilitators and "deal breakers": a mixed methods study investigating implementation of the Goal setting and action planning (G-AP) framework in community rehabilitation teams. *BMC Health Services Research* 2020, 20(1).
79. Bamford C, Heaven B, May C, Moynihan P: Implementing nutrition guidelines for older people in residential care homes: a qualitative study using Normalization Process Theory. *Implementation Science* 2012, 7.
80. Bowers HM, Williams SJ, Geraghty AWA, Maund E, O'Brien W, Leydon G, May CR, Kendrick T: Helping people discontinue long-term antidepressants: views of health professionals in UK primary care. *Bmj Open* 2019, 9(7).
81. Ehrlich C, Kendall E, John WS. How does care coordination provided by registered nurses "fit" within the organisational processes and professional relationships in the general practice context? *Collegian*. 2013;20(3):127–35.
82. Ohlsen S, Sanders T, Connell J, Wood E: Integrating mental health care into home-based nursing services: A qualitative study utilising normalisation process theory. *Journal of Clinical Nursing* 2021.
83. Alharbi K, van Marwijk H, Reeves D, Blakeman T: Identification and management of frailty in english primary care: A qualitative study of national policy. *BJGP Open* 2020, 4(1).
84. Bacchus LJ, Alkaiyat A, Shaheen A, Alkhayyat AS, Owda H, Halaseh R, Jeries I, Feder G, Sandouka R, Colombini M. Adaptive work in the primary health care response to domestic violence in occupied Palestinian territory: a qualitative evaluation using Extended Normalisation Process Theory. *BMC Fam Pract*. 2021;22(1):3.
85. Clarke DJ, Godfrey M, Hawkins R, Sadler E, Harding G, Forster A, McKevitt C, Dickerson J, Farrin A: Implementing a training intervention to support caregivers after stroke: a process evaluation examining the initiation and embedding of programme change. *Implementation Science* 2013, 8.

86. Connell LA, McMahon NE, Harris JE, Watkins CL, Eng JJ: A formative evaluation of the implementation of an upper limb stroke rehabilitation intervention in clinical practice: a qualitative interview study. *Implementation Science* 2014, 9.
87. Delvaux J, John A, Wedderburn L, Morris J: Implementation of Dynamic Lycra(R)Orthoses for Arm Rehabilitation in the Context of a Randomised Controlled Feasibility Trial in Stroke: A Qualitative study Using Normalisation Process Theory. *Rehabilitation Process and Outcome* 2020, 9.
88. Fredriksen E, Thygesen E, Moe CE, Martinez S: Digitalisation of municipal healthcare collaboration with volunteers: a case study applying normalization process theory. *BMC Health Services Research* 2021, 21(1).
89. Gillespie BM, Harbeck E, Lavin J, Gardiner T, Withers TK, Marshall AP: Using normalisation process theory to evaluate the implementation of a complex intervention to embed the surgical safety checklist. *BMC Health Services Research* 2018, 18.
90. Gossage-Worrall R, Hind D, Barnard-Kelly KD, Shiers D, Etherington A, Swaby L, Holt RIG, Holt RIG, Barnard-Kelly K, Gossage-Worrall R et al: STructured lifestyle education for people With Schizophrenia (STEPWISE): mixed methods process evaluation of a group-based lifestyle education programme to support weight loss in people with schizophrenia. *Bmc Psychiatry* 2019, 19(1).
91. Hall A, Wilson CB, Stanmore E, Todd C: Implementing monitoring technologies in care homes for people with dementia: A qualitative exploration using Normalization Process Theory. *Int J Nurs Stud.* 2017;72:60–70.
92. Mudge S, Sezier A, Payne D, Smith G, Kayes N: Pilot trial of The Living Well Toolkit: qualitative analysis and implications for refinement and future implementation. *BMC Health Services Research* 2020, 20(1).
93. Schubbe D, Yen RW, Saunders CH, Elwyn G, Forcino RC, O'Malley AJ, Politi MC, Margenthaler J, Volk RJ, Sepucha K et al: Implementation and sustainability factors of two early-stage breast cancer conversation aids in diverse practices. *Implementation Science* 2021, 16(1).
94. Tierney E, McEvoy R, Hannigan A, MacFarlane AE: Implementing community participation via interdisciplinary teams in primary care: An Irish case study in practice. *Health Expect.* 2018;21(6):990–1001.
95. Webb MJ, Wadley G, Sancu LA: Experiences of General Practitioners and Practice Support Staff Using a Health and Lifestyle Screening App in Primary Health Care: Implementation Case Study. *Jmir Mhealth and Uhealth* 2018, 6(4).
96. Clark M, Jolley D, Benbow SM, Greaves N, Greaves I: Exploring the scope for Normalisation Process Theory to help evaluate and understand the processes involved when scaling up integrated models of care: a case study of the scaling up of the Gnosall memory service. *J Integr Care.* 2021;29(1):3–21.
97. Davies M, Kristunas CA, Huddleston L, Alshreef A, Bodicoat D, Dixon S, Eborall H, Glab A, Hudson N, Khunti K et al: Increasing uptake of structured self-management education programmes for type 2 diabetes in a primary care setting: A feasibility study. *Pilot and Feasibility Studies* 2020, 6(1).
98. Drew S, Judge A, May C, Farmer A, Cooper C, Javaid MK, Goberman-Hill R, Judge AD, Arden N, Prieto-Alhambra D et al: Implementation of secondary fracture prevention services after hip fracture: A qualitative study using extended Normalization Process Theory. *Implementation Science* 2015, 10(1).
99. Nadav J, Kaihlanen A-M, Kujala S, Laukka E, Hilama P, Koivisto J, Keskimäki I, Heponiemi T: How to Implement Digital Services in a Way That They Integrate Into Routine Work: Qualitative Interview Study Among Health and Social Care Professionals. *J Med Internet Res.* 2021;23(12):e31668–e31668.
100. Hall A, Brown Wilson C, Stanmore E, Todd C: Moving beyond 'safety' versus 'autonomy': A qualitative exploration of the ethics of using monitoring technologies in long-term dementia care. *Bmc Geriatrics* 2019, 19(1).
101. Atkins S, Lewin S, Ringsberg KC, Thorson A: Provider experiences of the implementation of a new tuberculosis treatment programme: A qualitative study using the normalisation process model. *BMC Health Services Research* 2011, 11.
102. Sutton E, Herbert G, Burden S, Lewis S, Thomas S, Ness A, Atkinson C: Using the Normalization Process Theory to qualitatively explore sense-making in implementation of the Enhanced Recovery After Surgery programme: "It's not rocket science". *Plos One* 2018, 13(4).
103. Van Tiem JM, Reisinger HS, Friberg JE, Wilson JR, Fitzwater L, Panos RJ, Moeckli J: The STS case study: an analysis method for longitudinal qualitative research for implementation science. *Bmc Medical Research Methodology* 2021, 21(1).
104. Hernes T: A Process Theory of Organization: Oxford University Press; 2014.
105. Martindale A-M, Elvey R, Howard SJ, McCorkindale S, Sinha S, Blakeman T: Understanding the implementation of 'sick day guidance' to prevent acute kidney injury across a primary care setting in England: a qualitative evaluation. *Bmj Open* 2017, 7(11).
106. Fernandez ME, Ten Hoor GA, Van Lieshout S, Rodriguez SA, Beidas RS, Parcel G, Ruiter RA, Markham CM, Kok G: Implementation mapping: using intervention mapping to develop implementation strategies. *Front Public Health.* 2019;7:158.
107. Waltz TJ, Powell BJ, Fernández ME, Abadie B, Damschroder LJ: Choosing implementation strategies to address contextual barriers: diversity in recommendations and future directions. *Implement Sci.* 2019;14:1–15.

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