

# A framework for the implementation of certification procedures at nurse level: a case study in a French hospital

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## Research

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## **Abstract**

## **Background**

The implementation of certification procedures across healthcare systems is an essential component of the management process. In the past, several promising approaches have been developed towards the successful implementation of such policies, however, precise adaptation and implementation at the local context is essential. Thus, local activities must be considered to generate more pragmatic recommendations for managers. In this pilot study, we built an implementation framework for the inception of certification in healthcare facilities, particularly at nurse level activities. Our hypothesis comprised two objectives: the identification of key implementation process components, and the precise definition of these elements within local social activities.

## **Methods**

This study used a two-step abductive approach. The first was inductive, and consisted of a qualitative case study, where we analysed the implementation of certification procedures in a French teaching hospital. The study was conducted between April and December 2019. Data were collected using semi-structured interviews, and observations by shadowing. In the second step, the emerging data were analysed using two approaches: The Quality Implementation Tool (QIT) and Translational Mobilisation Theory (TMT).

## **Results**

Sixteen interviews were conducted with managers and nurses. We also accumulated 83 observational hours from two different wards. Our results showed that, first, all the retrieved elements over the implementation of certification procedures were captured by the QIT components and only one component was no applicable for the studied case. Second, we identified the elements in the local context of activity, with the different interrelationships between actors, actions and contexts, through the TMT. Third, our analyses were integrated and translated into a framework that described the implementation of certification procedures in healthcare facilities and with interest to the implementation at nurse/mid-managers level. In adopting QIT, the framework components took a transversal aspect then adapted to the local context of work through the TMT.

## **Conclusions**

In this study, we generated an implementation framework that underpinned a certification procedures implementation. Our approach revealed broad interactions between proximity managers, teams and

contexts during change mobilisation, not captured by transversal framework only as QIT. Going forward, this framework must be tested in future empirical studies.

## Contribution To The Literature

- This research extends our understanding of local social effects within the context of change implementation, rather than transversal elements. It shows how interrelationships between actors, context and actions shape implementation processes.
- This research demonstrates the emergence of certification procedures in healthcare organisations using Translation Mobilisation Theory, and shows how actions are embedded in nurse workflows.
- Finally, this study suggests a framework that deals with the implementation of certification at the nurse level, thus addresses literature gaps, and can help to promote a systematic uptake of certification into nurses' routine practices, and hence improve care quality and health.

## Background

Healthcare systems are becoming increasingly complex, patient are receiving care from different providers and there are multiplication of professionals' responsibilities, both are within a context of reduced and regulated length of patient hospitalization (1). A considerable efforts have been made towards improving quality and safety of provided care, as the proliferation of checklists, protocols and the attempts for care standardisation pathways (2). This context extends to impact professional workloads, mainly towards nursing groups (3), who are the largest providers of continuous patient care (4).

Quality measurement and management play a significant role in the reform, yield thus a timely example for managers and policy makers to consider in healthcare system(5). Since 2004, the certification is considered one of the main external quality evaluation procedures in the French healthcare system (6). It is iterative and mandatory for all healthcare facilities public and private as well, and it is conducted every four or six years (7). This "peer evaluation technique" is based on the International Organisation for Standardisation (ISO) standards (8), which not only considers the quality and safety of care provision, but also enhance continuously the organisation's performance and improve patient satisfaction(9). Certification has gradually evolved from the promotion and integration of quality improvement initiatives (6, 10), and the measuring of implementation metrics, in line with increased risk management and patient care (10). The latest wave of certification was more synchronised to each establishment's procedures, where it was based more on each facility's quality account monitoring tool, this device reflects each institution's commitment regarding its quality and risk management system and the improvement process(10). Certification evaluation strategies rely on standards and benchmarking, and must therefore encompass best clinical practices, care process audits (6), and be well supported by quality and safety indicators (Indicateur de Qualité et Sécurité des Soins, IQSS) (11, 12). Thus, this approach has imposed a multiplication model of care pathways, protocols and checklists, in order to manage quality and reduce

risk (2). For example, quality and risk management item includes -as outlined in the French national authority of health (Haute Autorite de Sante, HAS) certification manual-, a long list of criteria including policies governing quality and care safety improvements, professionals practices evaluation (Evaluation des Pratiques Professionnels, EPP), documents management, and management of adverse events, etc. (13).

In essence, these multiple requirements result in large workloads for nurses (3). This is primarily due to their prominence involvement in daily practices, and the nurses' ability to assist with others in the process of implementation and monitoring of certification procedures. Given to their familiarity with management, leadership and auditing issues (14). The certification procedures remain a major strategic and managerial issues for healthcare organisations in terms of preparation, implementation and day-to-day sustainability (15).

In terms of implementation, the literature offers several promising approaches (16, 17), where key attributes, facilitators, and barriers come together towards effective implementation strategies (17, 18) of this dynamic and fluid process (19). In 2015, Nilsen *et al.*, generated a differentiating approach incorporating three main aims (17); the *process model* which described and guided the translation of research into practice (18, 21); the *determinant framework* which explained and attempted to understand what influenced implementation outcomes (22–24), and *evaluation frameworks* which evaluated implementation efforts (25, 26). These approaches were essential, and generally emphasised transversal settings as cultural and leadership concepts (27). However, it is essential to define these transversal components at the activity level, and understand how interventions could become embedded into activity systems, and their implication for healthcare quality (28). Therefore, several studies stressed the importance of local socio-material infrastructures and their effects on change integration (27), and how it was pivotal to generate quality improvement results (29). Therefore, in considering the dearth of professional frameworks on nurse activities in the literature, in this pilot study, we constructed a framework to analyse the implementation of quality policies, using the certification procedure as an example. This approach was facilitated by two sub-objectives; to identify and frame key implementation components, and to explore different interrelationships shaping implementation at the local level of activity.

## **Methodology**

### **Design**

We used an abductive approach in this pilot study. The first inductive step was a qualitative case study, which was beneficial in studying phenomena in natural or 'real life' contexts (30). The process explained, described and explored how events occurred, and was invaluable for studying innovation implementation in healthcare systems (31).

### **Location**

The study was performed in a French teaching hospital, between April and December 2019, in the medical reanimation (Med Rea) and digestive endoscopy (Dig Endo) wards. Both are high risk sectors, and require high governance to manage risk and control safety in terms of professional practice (32). These factors are identified in the certification manual, thus making these areas more responsive to study perspectives.

The Med Rea sector has a patient/nurse ratio of 5:2, with serious patients requiring respiratory assistance, and are thus very much dependent on nursing and medical care. Med Rea nurses are qualified to manage and respond to contingencies and unexpected situations. The electronic health record (HER) system in this sector is partially integrated. The Dig Endo sector functions under a predefined intervention schedule; on average it experiences eight programmed interventions/day/room over 10 hours shift, 5 days/week. The area is highly technical, with a high patient rotation, and an integrated EHR system.

## **Data collection**

Data collection was based on semi-structured interviews, observations, and supported by the collection of documents relevant to the certification procedures.

## **Interviewees**

Interviewee sampling was performed based on a data saturation approach, which means interviews output reach closing sense, where the new interviews yield inessential information in terms of study aim (21). The interviewer discussed with participants the following topics: quality approaches in hospital, certification procedures, certification implementation processes and key elements, and its impact on nurse's activities. Interviews were conducted with participants from different hierarchical levels, as certification is a broad institutional measure. After e-mail contact and consent to participate, primary phase interviews commenced with nursing leaders. This approach also formalised access to local managers. Nurse interviews were also conducted during observations. Nurses with at least one year of work experience, with a French national diploma in nursing science (IDE) were chosen to base qualification levels, and avoid knowledge or experience bias in the sector. All interviews were recorded, transcribed and summarised.

## **Observations**

In both sectors, observations were conducted by the principal investigator (IS). Before these commenced, IS was introduced to staff to reiterate the research intentions over the observation period. This ensured IS was accepted onto both teams, and was not a stressor for shadowed staff. Staff were therefore comfortable in their actions, facilitating "real-life" observation of daily workflows. IS shadowed only one nurse after permission was granted, and observations were conducted over different days, ensuring at least one full shift in each sector was conducted, to observe and record different responsibilities. IS recorded brief notes as explicative commentaries, reflecting natural actions and reactions.

## **Document collection**

Various documents were collected from both sectors, e.g. patient files documentation, tractability sheets - such as checklists, blood transfusion follow-up, haemodialysis follow-up- in addition to working procedures and policies, Bord table for staff performance. Also IS was introduced to the hospital informatics system (Dx Care), and was granted permission to review electronic forms. During observation periods, IS attended staff and quality meetings.

## **Research ethics**

In France, this study does not require ethical permission from an ethics committee (33). However, clinical research requires informed consent from patients, but not if the study employs surveys in an administrative context (33). Nonetheless, participating hospitals require administrative review and clearance for staff and student interviews. This was obtained before data collection. The PI was sensitive to confidentiality issues, conducting interviews in private offices and providing comfortable and informal settings. A signed consent form was obtained from participants to formalise their willingness to participate in the study. This form also stated they could withdraw at any time. Interviews were conducted in private spaces, except for some Med Rea nurses, whose interviews were conducted at the nursing station. This was due to the critical status of some patients, and the need for direct and fast intervention. All interviewees and interview transcriptions were anonymised and conserved with an acronym according to the professional post of participant.

## **Data storage**

Interviews were stored in two different excel sheets; one for leaders and managers and one for nurses. Sheets were divided into questions, and each column represented one interviewee. Answers were accorded to the related question, thereby maintaining one concept in each row/column ‘case’. All data set are conserved on an encrypted access computer with a password protection.

## **Data analysis**

Analyses were two-fold: the first approach treated the implementation of certification procedures using a transversal implementation framework, i.e. QIT. This was a pragmatic user-friendly tool, based on an exhaustive review of the literature. It simplified 25 previous implementation approach studies, regardless of the intervention, environment or results (18). It consisted of six components in a tabular format, with each component divided into action steps in each row, and each row divided into three columns. These represented three distinct steps over the implementation process, i.e. i) planning, ii) real-time monitoring, and iii) innovation evaluation. QIT was primarily developed to implement quality (34). In this pilot study, QIT was used to analyse and determine key elements in the implementation of certification procedures.

The second approach is a middle range theory (35), based on ethnographic research on the “organising work” of nurse, where they are “obligatory passage points” in hospital to localise, refract and shape the materials and activities supporting patient care pathways (36). This systematic framework allows researchers to capture the emergence of contextually complex procedures during service processes (37). TMT embraces social, material and cognitive processes, leading to practice fulfilment. The TMT core

components are: '*project*' which is a goal-oriented strategic activity mobilised through '*mechanisms of mobilisation*' which are: object formation, articulation, translation, reflexive monitoring and sense-making across a '*strategic action field*'. This last, is defined by resources and conditions which enable and shape project mobilisation (35, 37). TMT has been used in different case studies, healthcare trajectory and multidisciplinary research projects (38, 39). TMT, was used to analysed the local context of nurse activities and explored the emergence of certification, which is "collaborative work practices" (28), in their daily workflow.

## Results

In total, 16 semi-structured interviews were conducted. Participants were from different organisational levels, divided between 8 top leaders and mid managers, and 8 nurses from both sectors. All participants were relevant actors to the certification procedures. In order to ensure the anonymity of research subjects, the interviews were numbered according to the sequence in which they occurred and with an acronym according to the professional respondent role over the implementation process. Namely TL for top leaders, MM for mid managers and RN for registered nurses.

In addition, 83 observational hours were conducted over four separate weeks, and were divided between one of the three modules in the Med Rea sector, and two interventional rooms in the Dig Endo sector. The average age of interviewed nurses was 43 years old, with an average nine years' work experience.

The following sections outline the data retrieved in this study; part I represents emerging elements over a certification implementation using QIT. Part II localises these components within the activity's context, with different mobilisation mechanisms.

## Part I

QIT analysis was conducted by aligning the tool's components with actions from manager and leader interviews. An additional table file presents more details on results analysis [see Additional file1]. Results show that the majority of elements were captured by QIT components and action steps. For the first component "Develop an implementation team", interviewees identified that the team in charge of certification implementation was well developed and structured, and this is benefits to the certification's age in hospital since 1999. They mentioned as well that the implementation team embraced multidisciplinary actors from different institutional levels "*Teams nowadays are well placed compared to the first procedure where we hadn't any quality team within the establishment... the caregivers also are well integrated now*" TL.

For the second "Foster supportive organisational climate and conditions", interviewees mentioned several key elements for the successful implementation of certification at the level of professionals, such as the presence of the 'referents of actions'. They are professionals, which have been chosen to assist in the process of implementation "*The referent nurses of hygiene will decline the procedures and best practices on the level of teams*" TL. It appears that they are adopting the role of champions. According to Miech et

*al.*, (2018), champion may emerge during an implementation process, sometimes as part of an intervention, sometimes as part of an implementation strategy, and at times neither; e.g. they thrive in the implementation environment (40). Other elements included the communication of procedural needs and benefits, and the professionals' implication, this last have been revealed as well in the cited responsibilities by nurses. These were considered key actions that were helpful to avoid professional resistance to the intended change. Another element was enhancing accountability, which was identified by the presence of quality management system (QMS), the possibility to conduct a test period for the implemented action and finally the on-going meetings. In addition to the presence of an administrative support as working procedures, protocols etc ... either in paper forms or electronic forms.

Another emerging component was "Receive knowledge and/or technical assistance". This was identified as support for nurses' practices "*We define in prior the needed supports, which training, the needed technical support with the constructor himself or the provider...in general, there is a table for the learning curve that helps to find out, the fluidity of technic*" MM. The implementation of certification occurs according to a programme, which is descend to the different departments and wards. That programme is developed based on national recommendations as identified by the HAS certification manual, and each sectors' quality account. It defined a set of tasks corresponding to each standard objective, over predefined timelines (Dig. Endo action plan), and responded to the "Develop an implementation plan" component.

The fifth QIT component; "Practitioner-expert collaboration" this component was not applicable in the case of certification, because healthcare organisations rely on national recommendations defined by the HAS. For the "Evaluate the effectiveness of the implementation" component, interviewees identified quantitative and qualitative evaluation strategies, which were carried out differently, according to the intended action. This was based on evaluation; actors readjusted and improved implementation effectiveness "*The ability to conduct a pre-test, an auto-evaluation and have feedback from each sectors, and see what we can do to improve because are important, the auto-evaluation allow to identify the missing things*" TL.

In addition to these comments, top leaders also cited major barriers for the implementation of certification at the different wards of the studied hospital, such as a lack of organisational support, time, information, human resources, a generalised professional resistance and overall a challenging process.

## Part II

This part of the study framed the identified components at the activity level. It incorporated previous analyses by explaining the different inter-relationships at the local context. This was based on triangulation between managers, nurse interviews and shadowed observations, all of which were aligned to TMT core components. An additional table file presents more details on results analysis [see Additional file 2].

The certification visit relies on a processes auditing approach supported by a patient tracer method (10). The HAS identifies healthcare system priorities, and each subject included a set of criteria and indicators (41), these standards define the quality programme of healthcare facilities as well as the policies and objectives to reach by the QMS (41). Hence, the higher goal of the healthcare system - defined by the care quality and patient safety- represents the ‘organising logics’ that determine the scope of possible action and activities within facilities and shape its purpose. The primary mobilisation of certification procedures initiate within departments based on a list of priority actions elaborated previously through the quality account tool. This occurred via a set of actions steps according to each sector action plan “*we have an action plan and a list of priority actions ... and we contact the quality engineer once a year for this action plan*” MM✉. The desired action is introduced to nurses by the proximity managers and/or by referent of action, this process reflects an ‘object formation’ mechanism, which is defined as “practices that create the objects of knowledge and practice and enrols them into projects” (37). Actions may have taken the form of new technologies and/or materials which supported practices, or interpretative repertoires such as protocol changes, policies, checklists and/or tractability documents. Through these, nurses translated recommendations and certification criteria, or other quality policies into practice. For example, in the Dig Endo sector, nurses were experimenting a new intervention, to identify the needed materials for the pre- and on-going intervention, they were using its working protocol as support for their preparations. The leader of change diffuses among nurses the needed change in the care process, its importance and benefits in terms of care quality and patient safety, in other words how it meets facility’s organisational logics, this reflects a ‘translation mechanism’. The last is defined as “practices that enable practice objects to be shared and differing viewpoints, local contingencies, and multiple interests to be accommodated in order to enable concerted action” (37). This was observed in nurses’ interviews; they are perceiving the importance of certification procedures for care quality, and patient safety, “*the certification procedures are a progress and enhancement tools of things that can be improved in the process of patient care*” RN✉. Healthcare systems by their very nature are dynamic and actions are changeable, thus, monitoring overall processes is important, particularly when implementing cross-sector processes or actions. It is essential to facilitate parallel actions pathways, and then ensure work harmonisation between different sectors. For example, in the Dig Endo sector, the implementation of checklist was intended for both units, with and without general anaesthesia (GA), the checklist was successfully integrated within GA unit, while it was not successfully working in the without GA unit. According to MM✉, the checklist was developed as a coordination sheet between the doctor and anaesthetist, however, in the without GA unit there is no anaesthetist, there is coordination between doctor and nurses. This created as result a lack in the tractability data. These feedbacks were used by the change leader, who worked with other transversal departments on a new version for the Dig Endo sector and other interventional sectors, such as interventional radiology. Changes were re-deployed and re-monitored to assess workability and acceptability amongst nurses. This ‘work articulation’ between multi-levels and sectors was fundamental. It occurred at team and departmental meetings, alongside the on-going monitoring of integrated changes. These key junctures relied on a shared culture and staff learning; they offered concrete actions by formalising workflow trajectories and ensuring work harmonisation and staff commitment. Evaluation of an implementation occurred continuously throughout the process; i.e.

both formally and informally. It described the occurrence and positioning of implemented actions at end-user level/nurses, as well as the global organisation's overview, this reflects a 'reflexive monitoring' mechanism; "*We have monthly performance tables, which allows not only a quantitative evaluation, but also a qualitative evaluation... we have follow-up indicator tables, and we monitor monthly or once every semester, or annually, and also we have morbidity rates which are monitored every two months*" MM. For example, in the Med Rea sector, nurses were using new intubation systems by tracing extubation rates, and were relaying their negative experiences at meetings. This feedback was considered a primary support in evaluating change feasibility and outcomes for patient care. Thus, nurses and managers sought to improve, "*we return to our action plan and adjust, according to the adverse events*" MM. This action mobilisation at the nurse level also depended on a 'sense-making' mechanism, which is defined as "practices through which actors interpreted, ordered, constructed and accounted for projects, and produced and reproduced institutions" (37). In the nursing field, nurses are actively engaged with certification procedures, e.g. they are involved in protocol preparation and validation, providing and sharing experiences, and contributing to auditing systems. By involving professionals in the process of implementation, actions and/or care processes take sense into their practices, this active engagement is valuable for an effective integration in the activity system. Professional active engagement provides meaning, and allows appropriate action mechanisms in the team. "*It's important that the caregivers understand the procedures; to make sense of its impact on patient care*" TL.

These mobilisation mechanisms i.e. object formation, articulation, translation, sense-making and reflexive monitoring, have helped shape the different interrelationships between action, actors and context (37), leading to certification programme implementation at activity level. Finally, the interviewed leaders emphasised as well on the role of proximity managers and their ability to conduct a participative strategy over the process of implementation "*the implementation depends on the proximity managers, this what we affirm between departments. So finally, there are the reality of the field and the ability of each manager to implement effectively*" TL.

## Discussion

In this case-study, we expanded the understanding of quality tool implementation in an activity system, by developing a framework of quality policy implementation in healthcare organisations, particularly at the nurse level.

Our proposed framework was developed based on certification implementation experiences and analyses in a teaching hospital, using two different approaches, the practical implementation sciences through the QIT (34) and sociological theory through the TMT (35) (Fig. 1). Firstly, based on QIT transversal components, we set out the framework key constituents. This implementation tool was useful in identifying gaps, and then helpful to guide implementer efforts to implement quality (34). Secondly, by using TMT core components, we outlined different interrelationships between actors, content and context, that shape and guide the implementation of certification procedures in hospital and at the local level of nurses (37). This systematic framework revealed how certification practices are embedded in the

workflow of nurse activities (28). It helps to capture the emergence this contextually complex procedures during service processes (36), regarding to the healthcare system reality, which is known as work of “many hands” (43)

Figure 1: The suggested implementation framework presents both levels incorporate in the implementation process the Macro reflects the healthcare systems by the organisational logics, the Meso level reflects the organisational level which comprises the following core components. **The contextual settings**: structure, materials and technologies, and interpretative repertoires. **The actors** implicated in the process of implementation over a certification procedures divided according to the organizational levels, the champions were presented beside the mid-managers and the nurses levels because they can emerge from the both levels. The **leadership approach** and the **mobilisation mechanisms** shaping the interrelationships between framework’s components including: object formation, translation, work articulation, reflexive monitoring and sense-making. The circle shape with flesh reflects the iterative form of the **certification**. Finally, the **outcome** reflects quality and safety of care provisions.

This analytical model represents how the implementation of certification occurs at the level of hospital with the concerns the organisational logics of healthcare system, which is represent the care quality and patient safety. The integration capabilities of these quality tools depends on key attributes and elements of local contexts interacting via multiple mobilisation mechanisms, in other words, the socio-material local context (29). In terms of the contextual settings for certification implementation at nurse levels, knowledge, resources and material availability are fundamental (44, 45). Administrative support, such as policies and operational protocols, are major facilitators of professional practice, in terms of action and/or processes (46). Otherwise, the lack in any of these contextual factors in addition to the time, may constitute a major barrier for both managers and nurses, and as results impede the implementation of the desired change (47). As identified in the content, context and process model of Pettigrew *et al.* (1992), multiple contextual factors contribute to a strategic change (48). Typically, a supportive organisational culture and key people leading the change, are instrumental at the local level of integration processes (49). In terms of change leaders, the action referent or champion of action are key actors in implementing certification programs. It is accepted they act as mediators between nurses and managers, with a capacity to diffuse information and support mobilised actions (50). The referents of actions – who are sometimes nurses- deploy, follow, monitor and reflect peer experiences in sectors, in order to improve change acceptability and sustainability, and thus outcomes. Due to their familiarity with the context, they can find out the needed contextual elements, the local context readiness to deploy the desired change (51). They considered as key performers over the implementation process of certification (52). Another factor was not identified per se, but emerged from interviews; implementation leadership, which was defined by a “strategic approach characterised by influencing behaviours to promote success in implementation” (53). The leadership approach (54) of proximity managers (55) facilitates an active engagement of nurses with deployment (56, 57). In addition, the possibility to experiencing a change feasibility and providing feedback on its organisational fit facilitates the acceptability and feasibility of implemented actions (58, 59), and avoids resource wastage (60). The Change leaders and nurses find out together the rhythm and extent of change implementation and its possibility within their services(61).

Hence, a supportive 'leadership quality' of the implementer (61) and 'sense-making' mechanism, both determine how professionals translate change into practice, to meet outcomes (37). Additionally, in terms of local context relationships, local managerial support is available for implemented actions (62). This is also observed by the communication of needs and benefits between professionals and decision makers (46, 56), thus reflecting a translational mechanisms (36). In addition, continuous communications between relevant actors (46), settles issues on confrontational situations (46), which reflect an work articulation mechanisms (35). These approaches are supported by the continuous monitoring of implementation effectiveness, in order to enhance and adjust the implemented action or the process and earn then the desired outcome (55, 56). These mobilisation mechanisms (35) shape the implementation process of certification procedures at nurse levels, and guide activity systems within healthcare organisations.

## **Study Limitations**

Our study had several limitations. Firstly, in the interview guide there is no direct question that develop the different QIT components, but elements were retrieved from interviewee narratives and matched by the different action steps. This may explain the absence of some action steps from the table of analysis. Secondly, some data may have been missed from nurse interviews due to circumstances. Nurses were obligated to interrupt interviews, to check on alerts and respond to patients. This elicited short and brief responses, and may not have entirely reflected their opinion. Thirdly, nurses were not observed and pursued over a long period for certification preparation. But the aim of observations was to recorded find out the emergence of certification practices in nurses daily workflow, as well as to find out how the work organisation and coordination between proximity managers and nurses. Finally, as this was an exploratory study in one setting, the data cannot be applied to all hospital settings.

## **Conclusions**

We propose a framework that analyses and describes the implementation of certification procedures on nurses' level. Our observations were generated from two different approaches; practical implementation science using QIT, and the TMT approach which is a sociological model that came out of the implementation sciences perspectives. TMT was beneficial in understanding the emergence of certification at local context of nurse activities, with the different relationships between nurses, managers and actions, and thus went far from the QIT to the reality of local nurse's level. Going forward, we aim to test this framework in national and international empirical studies.

## **Abbreviations**

### **HAS**

Haute Autorité de Sante (French national authority of health)

### **ISO**

International Organisation for Standardisation

**EPP**

Evaluation des Pratiques Professionnelles (Evaluation of professional practices)

**IQSS**

Indicateur de Qualité et Sécurité des Soins (Healthcare quality indicators)

**EHR**

Electronic Health Record

**IDE**

Infirmiers Diplômé d'Etat (Registered nurse qualification)

**QMS**

quality management system

**GA**

general anaesthesia.

## **Declarations**

### **Ethical approval and consent to participate**

In France, this study does not require ethical committee approval, as it does not directly concern patients. However, it does require institutional approval, which was agreed between the French School of Public Health and the teaching hospital centre.

### **Consent for publication**

All participants provided oral confirmation and written informed consent before participating in this study. This included consent to publish anonymous quotes from individual participants.

### **Availability of data and materials**

Datasets (which includes individual transcripts) are not publicly available due to confidentiality policies. However, they may be obtained under reasonable request conditions.

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### **Competing interests**

The authors declare no competing interests.

## **Author contributions**

IS and MW conceived the concept. IS, with the help of MW designed the study. IS was principal investigator, and performed observations, interviews, analyses, and developed the conceptual framework. IS wrote the first draft and collaborated with MW to generate the final draft. MW verified the analytical methods, proposed corrections and supervised the overall research. Both authors provided critical feedback and helped shape the research, analyses and manuscript. Both approved the final version.

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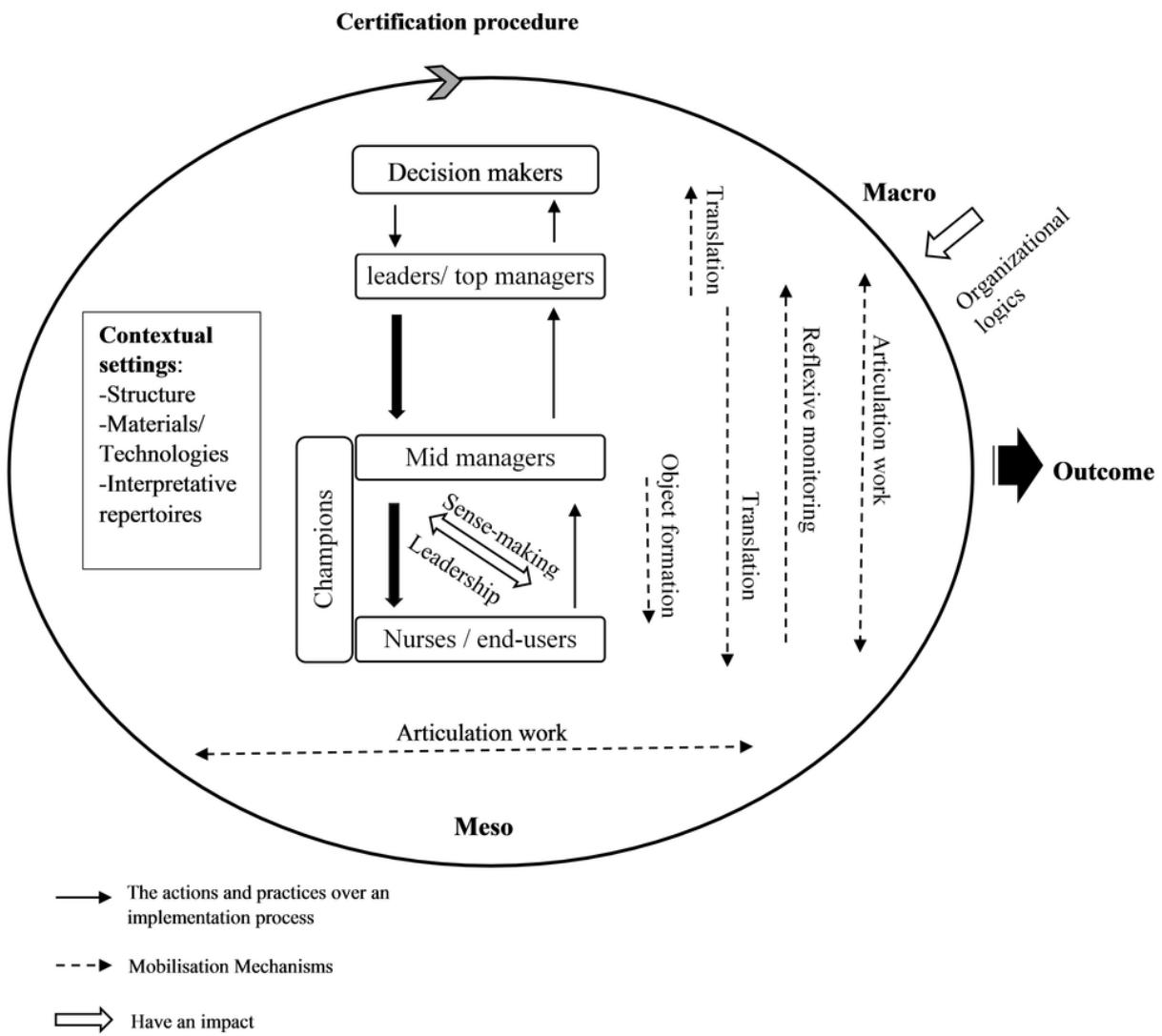
## Additional Files

Additional file 1: Table analysis for Part I using the quality implementation tool (QIT).

Additional file 2: Table analysis for Part II using translational mobilisation theory (TMT).

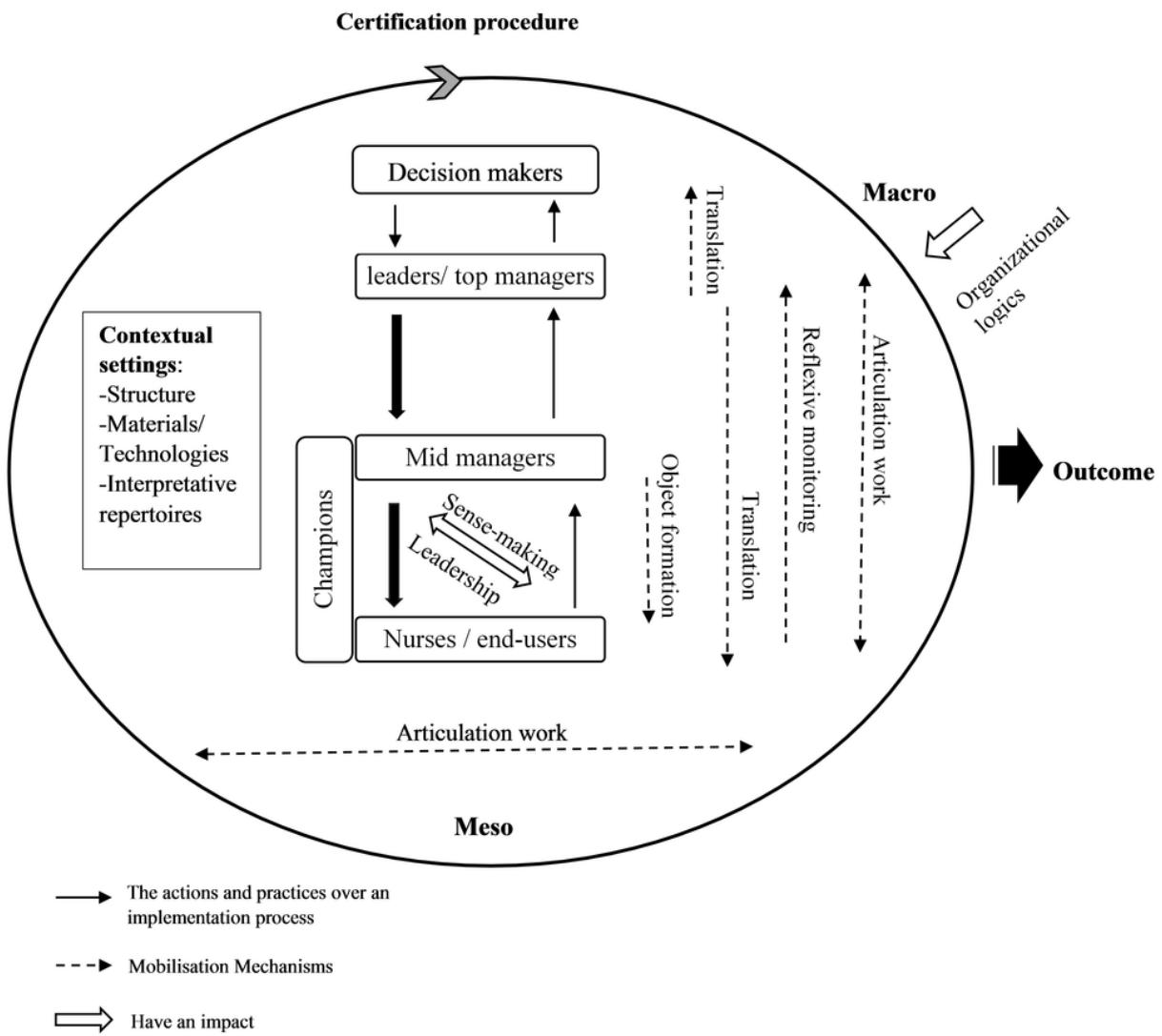
Additional file 3: study reporting checklist using the COREQ checklist.

## Figures



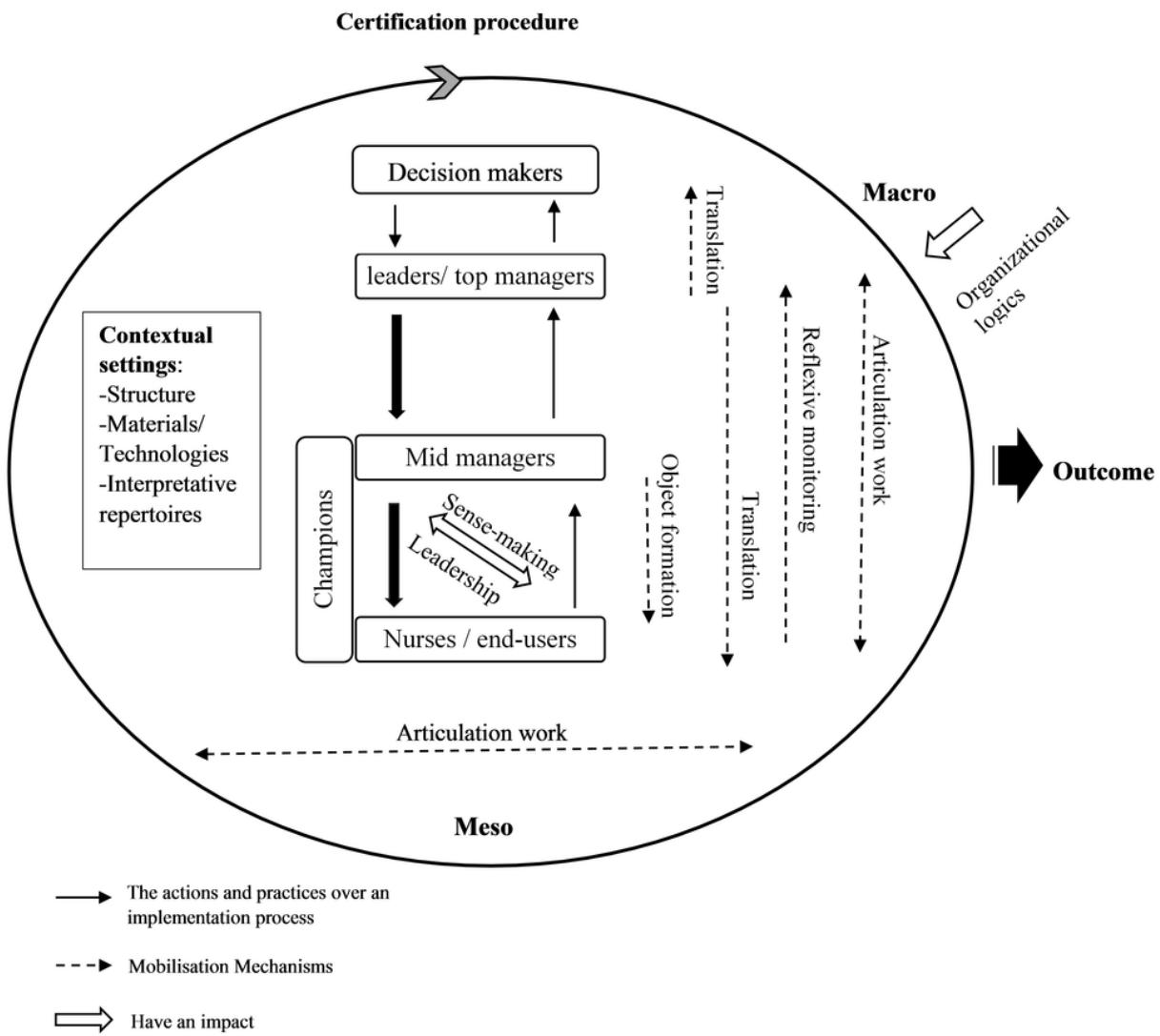
**Figure 1**

Proposed implementation framework



**Figure 1**

Proposed implementation framework



**Figure 1**

Proposed implementation framework

## Supplementary Files

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